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ENTRIES 458-871

AGRONOMY

C. V. PIPER, *Editor*

458. ANONYMOUS. **I. Results of wheat varieties and manurial trials.**—Season 1918-19. Jour. Dept. Agric. Victoria 17: 158-163. 1919. II. [Same title.] *Ibid.* 17: 217-221, 1919.—See Bot. Abstr. 3, Entry 844.

459. BAKER, A. L. **Those official potato grades.** Potato Mag. 1[9]: 15, 25. *1 fig.* 1919.—Proposes certain changes.—*Donald Folsom.*

460. BELL, H. G. **The fertilizer situation for 1919.** Potato Mag. 1[9]: 5, 23, 28. 1919.—Discusses the situation in regard to potatoes.—*Donald Folsom.*

461. BERRY, JAMES B., AND JOHN K. GILES. **The production of corn. Corn Club Guide. Part I.—Increased yields as a result of disease control.** Georgia State Coll. Agric. Bull. 165. *16 p., fig. 13.* 1919.

462. BOBILLIARD J. **The flax industry.** Jour. Dept. Agric. Victoria 17: 222-230. *Pl. 10.* 1919. Flax cultivation, varieties, seeding, manuring and soil preparation and milling are discussed.—*J. J. Skinner.*

463. BURLINSON, W. L., AND W. I. BROCKSON. **Sweet clover production.** Illinois Agric. Exp. Sta. Ext. Circ. 29. 7p. 1919.—The circular discusses the methods to be employed in sweet clover culture, either for hay or for seed.—*M. J. Prucha.*

464. BURLINSON, W. L., AND R. W. STARK. **Spring wheat for Illinois.** Illinois Agric. Exp. Sta. Bull. 214: 315-320. 1919.—Several varieties of spriog wheat were tested for productivity under Illinois conditions.—*M. J. Prucha.*

465. CROSS, W. E. **Experiments on stripping cane.** Louisiana Planter and Sugar Manufacturer 62: 301-302. *1 fig.* 1919.—Experiments at the Tucuman (Argentina) Experiment Station indicate that stripping off the lower leaves has no effect on hastening the maturity of sugar cane.—*C. W. Edgerton.*

466. DASH. J. SYDNEY, **The sugar industry in the island of Guadeloupe, French West Indies.** Louisiana Planter and Sugar Manufacturer 62; 124-126. *2 fig.* 1919.—Discusses briefly the problems of the sugar industry that are being investigated by the Experiment Station, including cultural methods, cane varieties, cane diseases, etc.—*C. W. Edgerton.*

467. Fisher, M. L. **The washed lands of Indiana: A preliminary study.** Indiana (Purdue) Agric. Exp. Sta. Circ. 90: 11–24. *Fig. 1–18.* 1919.—Much land in Indiana which was once productive has become practically worthless because of erosion. The worst conditions are found on the moderate slopes of 3 to 10 per cent. This erosion is due largely to the deforestation of steep hillsides, too heavy pasturing, a poor system of farming, and neglect. Methods of prevention of erosion and of reclamation of washed slopes are given.—*Max W. Gardner.*

468. Garber, R. J., and P. J. Olsen. **A study of the relation of some morphological characters to lodging in cereals.** Jour. Amer. Soc. Agron. 2: 173–187. *Fig. 1–8.* 1919.—Extreme varieties with regard to lodging and non-lodging in wheat, oats and barley were selected for this study. Measurements were also made on Minnesota No. 2 winter rye which stands up better than the other cereals. A study was made of the correlation between lodging behavior and average size of culm, average number of bundles, average area of sclerenchyma, thickness of culm wall, length of lignified cells and thickness of lignified cell wall. None of the above mentioned characters except thickness of cell wall seems closely related to lodging. Both early and medium oat varieties examined showed distinct correlations between thickness of lignified cell walls and lodging. In general, lodging in cereals is dependent on so many factors of unequal value in the different sorts that no one factor seems to be correlated closely enough with lodging to be of much value as a selection index. Among the different strains of oats and barley the average number of vascular bundles was found to be correlated with average diameter of culms.—*F. M. Schertz.*

469. Gordon, George S. **Tests with flax varieties.** Jour. Dept. Agric. Victoria 17; 164–170. *Pl. 4.* 1919.—Of 3 varieties of English flax, the Northern Linseed produced the largest yields. The percentage of oil in each was approximately the same. The American variety of fibre flax, "Blue Blossom," compared well in growth with the English varieties, and appeared disease resistant.—*J. J. Skinner.*

470. Gray, G. P. **Tests of chemical means for the control of weeds.** Univ. California Publ. (Agric. Sci.) 4: 67–97. *Fig. 1–11.* 1919.—A report of progress on experiments on the control of the wild morning *glory [Convolvulus arvensis]* involving trials of sodium arsenite, sodium cyanide, sulfuric acid, and acid sludge. The herbicides were either introduced into the soil, or sprayed upon the foliage.—The application of a spray of sodium arsenite to the foliage, while not wholly successful, gave some promising results. The spray was more toxic when the plants were approaching the dormant condition and when the moisture content of the air was sufficient to prevent rapid evaporation.—*H. S. Reed.*

471. Larsen, S. G. **Potato silage—how to make and use.** Potato Mag. 1°: 14. 1919.

472. Le Clerc, J. A. **Potato flour and potato bread.** Potato Mag. 1°: 9–10, 29–31, 33. 3 *fig.* 1919.—Discusses preparation, composition, use and value of potatoes and potato products, with special reference to bread-making.—*Donald Folsom.*

473. Lewis, A. C., and C. A. McLendon. **Cotton variety tests, 1918.** Georgia State Bd. Entomol. Bull. 52. *40 p. Fig. 1.* 1919.—In South Georgia, all that part of the state south of a line from Augusta through Macon to Columbus, where wilt *[Neocosmospora vasinfecta]* occurs, only varieties of cotton (*Gossypium.*) resistant to it should be grown, such as Lewis 63, Council-Toole and DeSoto. Where wilt does not occur in this section pure strains of Toole, Cleveland Big-Boll, Cook's Improved and College No. 1 are recommended. In North Georgia, Cleveland Big-Boll, Cook's Improved and College No. 1 are recommended —*T. H. McHatton.*

474. McClellan, W. R. **Growing potatoes in the Greeley district in 1918.** Potato Mag. 1°: 9, 30–32. 1919.—Describes effects of 1918 weather and results from using selected seed stock.—*Donald Folsom.*

475. MULLETT, H. A. **Minyip crop and fallow competition.** Jour. Dept. Agric. Victoria 17: 65–75. *Fig. 7.* 1919.—See Bot. Abstr. 3, Entry 880.

476. MULLETT, H. A. **Garoke crop and fallow competition, 1918.** Jour. Dept. Agric. Victoria 17: 193–206. *Fig. 7.* 1919.—See Bot. Abstr. 3, Entry 862.

477. OLIN, W. H. **Blood will tell in potatoes.** Potato Mag. 1[1]: 7. *1 fig.* 1919.—Describes methods of a successful grower of seed stock.—*Donald Folsom.*

478. PRESCOTT, S. C. **Dehydration of vegetables—past, present and future.** Potato Mag. 1[9]: 6, 16–17, 20–23. *4 fig.* 1919.—Describes development of the dehydration industry, the methods employed, and discusses its importance.—*Donald Folsom.*

479. PURVIS, J. E. **Bracken as a source of potash.** Proc. Cambridge Phil. Soc. 19: 261–262. 1919.—Confirms report that in the summer months the bracken (*Pteridium aquilinum* (L.) Kuhn) contains more potash than in later months. The bracken ferns grown on Welsh peaty soil yield more potash than those grown on Cambridge poor sandy soil.—*Michael Levine.*

480. STEINEL, A. T. **Story of the Skookum apple and its lesson for potato growers.** Potato Mag. 1[9]: 5, 33–34. *1 fig.* 1919.—Advocates better marketing methods.—*Donald Folsom.*

481. STEWART, F. C. **Missing hills in potato fields: their effect upon the yield.** New York Agric. Exp. Sta. [Geneva] Bull. 459: 45–69. *Fig. 1–8.* 1919.—An account of an experiment designed to show how much of the loss due to missing hills or "skips" in potato (*Solanum tuberosum*) fields is made up by the increased yield of adjoining plants. It was found that, in the case of a "skip" containing a single missing hill, the two adjoining plants (one on either side) together make up 46.4 per cent of the loss in total yield. From the data obtained, a formula is evolved for use in computing the comparative yields of plats having different percentages of missing hills; but it is pointed out that this formula applies only to a single set of conditions, *viz.*, such as obtained in the experiment.—Some data were obtained, also, on the difference in the yield of the two members of a pair of plants from halves of the same tuber when grown under conditions as nearly parallel as possible to field conditions. For 85 pairs of plants, the average difference, expressed in percentage of the mean yield of the pair, was 20.7 per cent.—*F. C. Stewart.*

482. STUART, WILLIAM. **Commercial potato production in Florida.** Potato Mag. 1[9]: 6–8, 24–25. *Fig. 1–9.* 1919.—Discusses soil, location, varieties, importance of crop, irrigation and other cultural practices, and marketing.—*Donald Folsom.*

483. TRACY, S. M. **Rhodes Grass [*Chloris gayana*].** U. S. Dept. Agric. Farmer's Bull. 1048. *14 p., 3 fig.* 1919.

484. WALDRON, L. R., AND J. A. CLARK. **Kota, a rust resisting variety of common spring wheat.** Jour. Amer. Soc. Agron. 2: 187–195. *Fig. 1–3.* 1919.—A variety of bearded, hard, red spring wheat designated as Kota (U. S. Dept. Agric., C. I. No. 5878) has been shown to possess resistance to the form or forms of the stem rust of wheat present at Fargo, North Dakota, Brookings, South Dakota, and St. Paul, Minnesota, in 1918. Some evidence of such resistance had previously been secured in 1917. This resistance is decidedly greater than that possessed by the common spring wheats and second only to the more resistant durum wheats. Results secured at Fargo, North Dakota, in 1918 showed a capacity for yield decidedly above the average of the common wheats and only slightly less than the average yield of the durum wheats. Milling tests conducted with Kota wheat showed it to produce somewhat less flour than the average of other wheats used in the same test. Baking tests ranked it very high as a bread wheat, as it markedly exceeded the other common wheats except Marquis, which it equaled.—*F. M. Schertz.*

485. Westbrook, Edison C., and A. B. Hursey. **Tobacco culture. Bright leaf or flue-cured tobacco.** Georgia State Coll. Agric. Bull. 171. *20 p., 8 fig.* 1919.—General instructions for raising and curing tobacco, also plans for making curing houses.—*T. H. McHatton.*

486. Wiancko, A. T. **How to increase Indiana corn yields.** Indiana (Purdue) Agric. Exp. Sta. Circ. 91. *20 p., fig. 1–10.* 1919.—General advice is given to farmers relative to corn production in Indiana including choice of variety, improvement of seed by ear-to-row testing, selection and proper storage of seed ears, germination tests to eliminate unsatisfactory ears, rotational practice, soil fertilization, and cultural methods.—*Max W. Gardner.*

487. Wiancko, A. T., and C. O. Cromer. **Spring small grains in Indiana.** Indiana (Purdue) Agric. Exp. Sta. Bull. 225. *20 p., fig. 1–14.* 1919.—Comparative yield data secured between 1904 and 1918 at Purdue upon a number of varieties of oats, spring barley, and spring wheat and upon spring emmer and spring rye are presented. Comparison of these with the yields of winter wheat and rye leads to the conclusion that the climate of Indiana is in general too warm for the satisfactory development of spring-sown small grains. In the northern part of the state, oats and barley may be profitably grown. Oats is the principal spring grain grown in Indiana. General data relative to oat culture is given including methods of seed grain disinfection and the results of tests upon different rates of seeding.—*Max W. Gardner.*

488. Wiancko, A. T., S. D. Conner, and S. C. Jones. **The value of legumes on Indiana soils.** Indiana (Purdue) Agric. Exp. Sta. Bull. 226. *20 p., fig. 1–6.* 1919.—Out of 11,000,000 acres in field crops in Indiana, only 1,000,000 is in legumes. Twenty-five to 50 per cent of the nitrogen and humus of Indiana soils has been used up or lost, and 3,000,000 acres should be annually in legumes. Field tests in eight localities during 12 years show that crop rotations containing legumes resulted in an average increased yield of 4.6 bushels of corn and 4.7 bushels of wheat per acre as compared with rotations in which no legumes were included. Clover is the most practical legume for use in Indiana. General information relative to clover culture is given. Soy beans or cowpeas may be used on acid soils, alsike on wet soils, and hairy vetch or cowpeas on light sands.—*Max W. Gardner.*

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*

489. Anonymous. **Endowment of scholarship and prizes.** Brooklyn Bot. Gard. Rec. 7: 88. July, 1918.—Cash prizes for school garden and nature study work at Brooklyn Botanic Garden are dealt with.—*C. S. Gager.*

490. Anonymous. **Prospectus of courses offered by the Brooklyn Botanic Garden, 1919.** Brooklyn Bot. Gard. Rec. 8: 1–13. Jan., 1919.

491. Cook, Melville Thurston. **Applied economic botany, based upon actual agricultural and gardening projects.** *i–xviii+261 p. 148 illustr.* J. B. Lippincott Company, Philadelphia and London, 1919.—A volume in the Farm Life Text Series, edited by K. C. Davis. Part I deals with plant life; Part II, with most important families of economic plants, with special exercises. The plan includes three things. First, a brief statement of recognised facts and principles concerning plants and plant growth usually given in text-books for secondary schools; second, a list of simple exercises and suggestions for observations, which the pupil can conduct without great difficulty and which will demonstrate many of the statements given in the book, and, third, a list of questions intended to be suggestive to the pupil, and to encourage further studies.—*C. S. Gager.*

492. Dille, Alvin. **Lessons on potatoes for elementary rural schools.** U. S. Dept. Agric. Bull. 784. *24 p.* 1919.—A detailed outline of twelve lessons on the potato [*Solanum tuberosum*] covering the following general topics: Selection of seed in the field; harvesting

and grading; marketing; winter storage; judging; structure of the potato plant and tuber; place of potato in crop-rotation; soil and fertilizer requirements; planting, including seed treatment; cultivation; potato pests; uses of the potato. A bibliography of publications relating to potatoes issued by the United States Department of Agriculture is appended.—*J. R. Schramm.*

493. GAGER, C. STUART. Seventh annual report of the Brooklyn Botanic Garden, 1917. Brooklyn Bot. Gard. Rec. 7: 33–82. Apr., 1918.

494. GAGER, C. STUART. A brief history of the botanic garden idea in Brooklyn. Brooklyn Bot. Gard. Rec. 7: 99–112. Oct., 1918.—Gives the history of the "Hunt Brooklyn Botanic Garden" (1855–1856) and of the botanic garden which it was proposed to establish in Prospect Park (Brooklyn) in 1861; also gives brief history of the land included in the present Brooklyn Botanic Garden and the steps leading to its establishment, referring to a fuller account of the present garden (Brooklyn Bot. Gard. Rec. 2: 109–114. Oct., 1913).—*C. S. Gager.*

495. GAGER, C. STUART. Eighth annual report of the Brooklyn Botanic Garden, 1918. Brooklyn Bot. Gard. Rec. 8: 25–93. Apr., 1919.—Includes reports of the director, the curator of plants, the curator of public instruction, and the librarian; also financial statements.—*C. S. Gager.*

496. G[AGER]. C. S. Science in peace and war. Brooklyn Bot. Gard. Rec. 7: 89–92. July, 1918.

497. GUSS, ROLAND W. Gardening and nature study in the schools of Cincinnati. Nat. Study Rev. 15: 85–87. 1919.—Children's garden products valued at three times cost of gardening budget.—*A. Gundersen.*

498. GUSS, ROLAND W. Transportation of city children to the suburbs for gardening. Nat. Study Rev. 15: 87–88. 1919.—Cincinnati Board of Education pays carfare to children's gardens under certain regulations.—*A. Gundersen.*

499. HOPPING, ALEITA. Mineral nutrition in plants—some suggestions on teaching the subject to high-school students of biology. School Sci. Math. 19: 302–304. 1919.—Advocates use of three-salt solution, such as one containing calcium nitrate, magnesium sulphate and mono-potassium phospbate.—*A. Gundersen.*

500. LEE, Y. K. [Chinese.] [Education in forestry.] Khu-Shou [Science, a publication of the Science Society of China.] 4: 159–163. 1918.

501. SHAW, ELLEN ENNY. Fifth annual children's garden exhibit. Brooklyn Bot. Gard. Rec. 7: 112–113. Oct., 1918.

502. ULLRICH, FRED T. Some reasons for the study of trees in nature-study in the elementary schools. Nat. Study Rev. 15: 19–26. 1919.—Economic, aesthetic and religious reasons.—*A. Gundersen.*

FOREST BOTANY AND FORESTRY

RAPHAEL ZON, *Editor*

503. ALGAU, H. Calcul du préjudice résultant de l'abatage prématuré des arbres forestiers. [Calculation of the damage resulting from the premature cutting of forest trees.] Bull. Trimest. Soc. Forest. Franche-Comté et Belfort 13: 7–15. 1919.—The damage to a forest resulting from its premature exploitation is measured by the difference between its expectation value and its present sale value for immediate utilization. The smaller the trees, the more rapid their growth; the greater the increase in value per unit of volume as the trees

increase in size, the greater is the damage. Detailed calculations are given showing that, in the case of two stands of fir or spruce, with different rates of growth, and with diameters ranging from 6 to 16 inches, the damage may vary from 200 per cent of the present sale value in case of the 6-inch trees to 5 per cent or less in the case of the 14-inch trees, 4 per cent being assumed as the rate of interest. No damage is done in the case of the 16-inch trees, which are ready for exploitation. So many variable factors, often impossible of exact determination, are involved, that any very accurate estimate of damage is practically out of the question.—*S. T. Dana.*

504. Anonymous. **Report of the Division of Forestry for the biennial period ended December 31, 1918.** *53 p.* Territory of Hawaii, Bd. of Agric. and Forest., 1919.—This report covers the activities of the Hawaiian Division of Forestry in 1917–18 and presents chiefly the progress made in placing the forest reserve system under administration and in the work of reforestation. On December 31, 1918 there were 47 forest reserves in the islands, with an area of 814,926 acres, of which 68 per cent is Government land. The protection of these areas is vital, as they directly govern the water supplies of lower lands, and fencing against stock and elimination of wild stock from fenced areas are the first necessities, since the forests deteriorate into grassland if not protected. Fires have been guarded against and only five occurred in the biennium.—Forest extension has been pushed; both by the experimental introduction of new species and by the larger-scale planting of species of known worth, largely koa, Jeffrey pine, Coulter pine, Jack pine, Scotch pine, Norway spruce, incense cedar and white pine have developed well at an elevation of 6,700 feet. A total of 1,632,598 trees of all species have been planted by private land owners and 776,045 by the Territory of Hawaii, in 1917–18.—*F. S. Baker.*

505. Anonymous. **Diseases in plantations of exotic trees.** New Zealand Jour. Agric. 18: 63. 1919.

506. Anonymous. **Machine to locate forest fires.** Canadian Forestry Jour. 14: 149. April, 1919.—A description is given of the Osborne fire finder, to be used at look-out stations, together with the manner in which the machine is to be used.—*E. N. Munns.*

507. Anonymous. **Nos forêts retrouvées: statistique sommaire des bois de l'État en Alsace et en Lorraine. (Statistical summary of the state forests in Alsace and Lorraine.)** Bull. Trimest. Soc. Forest. Franche-Comté et Belfort 13: 5–7. 1919.—The state forests in Alsace and Lorraine cover 374,000 acres in five different departments and are composed largely of high forest.—*S. T. Dana.*

508. Anonymous. **Le Beau en matière forestière.** [Beauty in forest matters.] Bull. Trimest. Soc. Forest. Franche-Comté et Belfort 13: 18–20. 1919.—Beauty as well as utility should be considered in restoring the forests devastated by the war. Simple coppice, coppice under standards, and even-aged high forest are all inferior in beauty to a selection forest, which resembles a cleared-up virgin forest. As Broilliard has said, "Are we not forced to the conclusion that the best treatment of forests is that which renders them the most beautiful?"—*S. T. Dana.*

509. Anonymous. [E. A.] **Buskfuru. Pinus montana uncinata, P. pumila and P. m. gallica.** Tidsskr. Skogbruk 26: 375–376. *Pl. 1.* 1918.—Success has attended the planting in Norway of the above-named species, the seed of which has been received from France at frequent intervals during the last 50 years. These pines produce wood for fuel on exposed sites and poor soil where the native trees do not grow.—*J. A. Larsen.*

510. Anonymous. [J. W.] **Skogsentomolgiens stilling i Sverige. [Forest entomology in Sweden.]** Tidsskr. Skogbruk 26: 376–378. 1918.

511. ANONYMOUS [L.] **Kaninchenverbiss in Kiefernkultur.** [Rabbit damage to pine plantations.] Deutsch. Forstzeitg. 34: 50–51. 1919.—Need for food during the war led to considerable raising of tame rabbits as well as to a higher regard for wild ones. These do great damage to pine plantations. The common remedy, aside from exterminating the rabbits is to fence plantations with woven wire, which is expensive and impracticable for areas greater than 2 hectares. A better method for larger plantations is to use either plants grown with balls of earth, or twice transplanted stock, at least 1 meter high. Although expensive, this method is less so than fencing, and also insures more successful plantations.—*W. N. Sparhawk.*

512. ANONYMOUS [P. F.] **Amélioration des chemins forestiers.** [Improvement of forest roads.] Rev. Eaux et Forêts 57: 69–74. *Fig. 1–3.* 1919.—Forest engineers have been too given to the use of straight lines in laying out forest roads, with the result that the latter can not always be used satisfactorily for the transportation of forest products. This difficulty should be avoided by using curves to carry roads around obstacles such as lakes, cliffs, and ravines. Methods are given in some detail for laying out reverse curves and for constructing directly the arc of a circle by means of an inscribed regular polygon.—*S. T. Dana.*

513. ARNOULD, A. **Dommages causés aux végétaux par les fumées industrielles.** [Damages caused to plants by industrial fumes.] [Rev. of: HOLMES, J. A., E. C. FRANKLIN, AND R. A. GOULD. Report of the Selby Smelter Commission. U. S. Dept. Int., Bur. Mines, Bull. 98. *528 p., 41 pl., 14 fig.* 1915.] Rev. Eaux et Forêts 57: 121–125. 1919.

514. BERRY, JAMES B. **Trees, their use and abuse.** Georgia State Coll. Agric. Bull. 162. *19 p., 18 fig.* 1919.

515. BLAIR, THOMAS ARTHUR. **Influence of snow cover on the temperature distribution in Utah, January, 1919.** Monthly Weather Rev. 47: 165–166. 1919.

516. BLUM. **Windschaden in bayerischen Hochgebirge.** [Wind-damage in Bavarian mountains.] Deutsch. Forstzeitg. 34: 70. 1919.—Winds blew over some 500,000 cubic meters of timber, principally spruce, between January 3, and 7, 1919. Damage to the remaining forest by bark beetles is feared.—*W. N. Sparhawk.*

517. BRADLEY, J. W. **A useful wood-splitting machine.** Indian Forester 45: 18–21, Jan., 1919.—A machine employed during the coal shortage in India is described, with a diagram showing the plan of operation.—*E. N. Munns.*

518. BROWN, W. R. **Experiments in scientific cutting.** Canadian Forestry Jour. 14: 169–172. April, 1919.—A descriptive account is given of different methods of cutting in the spruce and fir forests of New Hampshire and Maine, which were employed in the early nineties. Selective cuttings to a diameter of 14, 12 and 10 inches were tried, with clean cutting of conifers in strips and clean cutting proper in both mixed stands and pure conifers. It was found that, in the selective system, the 14-inch diameter limit appeared to be best, but the trees did not appear to recover after being released from suppression. This was also true of the cuttings in the other diameter classes, but the increased cost due to returning for the slight amount of material left on the ground, was prohibitive. Wind-fall was the worst enemy of the strip method, while removing the conifers from the mixed stands resulted in the dominance of the hardwoods. Clean cutting was not feasible because the reproduction of hardwoods more than offset the small amount of reproduction of conifers. The following conclusions are stated:—(1) The diameter limit in cutting should be based on the average age of the stand instead of on the average size of the trees. (2) Pure coniferous stands should be clean cut, leaving seed-trees for reproduction. (3) In even-aged, mixed stands, with deep soil and in locations protected from wind, thinning can be made by selective cutting when the hardwoods are removed. In poor stands the strip or group system can be applied under the same conditions. (4) Balsam-fir should be clean cut and the hardwoods destroyed wherever possible, if they cannot be marketed. (5) All methods of selective cutting should be applied with the expectation that there will be more or less loss from wind.—*E. N. Munns.*

519. Brush, W. D. Utilization of elm [Ulmus]. U. S. Dept. Agric. Bull. 683. *43 p., 4 pl., 8 fig.* July 29, 1918.—Although limited in the amount of its stand, elm is an important wood for bent work and for uses in which it is subject to shock or impact and rough use in general. There are five species which produce the supply of elm wood in the United States: White elm (*Ulmus americana*), slippery elm (*U. fulva*), cork elm (*U. racemosa*), wing elm (*U. alata*), and cedar elm (*U. crassifolia*). The mechanical properties, the wood structure, location of supplies, and sizes attained are discussed for the different species. Cork or rock elm is considerably stronger than the other species. It is estimated that about 75 per cent of the total stand of elm, which is estimated at 7,500,000,000 feet, is white elm, half of which is located in Michigan, Wisconsin, and Minnesota. The present lumber cut of elm, 240,000,000 board feet, places it twentieth in rank among all woods and tenth among hardwoods in point of lumber production. The lumber cut has decreased considerably in the last 10 years as shown by tables. Practically all the elm cut, except that cut for fuel, goes to factories to be used in the manufacture of various products. The leading industries consuming it, in order of amount used, are slack cooperage (39.6 per cent) boxes, baskets and crates (18.1 per cent), vehicles and vehicle parts (8.7 per cent), chairs and chair stock, woodenware and dairymen's and poulterers' supplies, musical instruments, refrigerators and kitchen cabinets, furniture, agricultural instruments and trunks and valises. Grading rules, lumber prices, the value of standing timber, and marketing of elm timber are all discussed and a classified list of uses of elm in different wood-using industries is given.—*W. D. Sterrett.*

520. Bryant, R. C. The war and the lumber industry. Jour. Forestry 17: 125–134. 1919.—The war developed the fact that the lumber industry of the United States was not sufficiently elastic or resourceful to meet the demands made upon it, necessitating aid of all kinds. The lack of public spirit on the part of the lumbermen and their narrow point of view were remarkable and were overcome temporarily through the office of a lumber director. As a whole, lumbermen do not grasp their relationship to the public and forestry has apparently not gained recognition on private lands. A more complete study of lumber economics is urged.—*E. N. Munns.*

521. Butterwick, A. J. S. The use of Atlas preservative to kill trees. Indian Forester 45: 22–25. Jan., 1919.—Twenty tests were carried out on the use of the preservative upon various Indian woods, using only trees with very little or no heartwood, as these are the most difficult to kill by girdling. The trees were deeply girdled and the antiseptic was painted over the exposed wood. No results were noted; the treatment was applied in July and the trees retained their normal green foliage and sprouted. Trees were also treated with the preservative by injection, holes being bored several inches deep, into which the poison liquid was introduced. The results were variable and led to the conclusion that these methods were not advisable in practice.—*E. N. Munns.*

522. Cabrera, Teodoro. Tortas para hacer carbon. [Fuel bricks.] Revist. Agric. Com. y Trab. 2: 173. 1919.—It was found that the fruit of the tree, *Enterolobium cyclocarpum* Griseb., which grows very commonly along the roads, makes an excellent adhesive to form bricks or bits of carbon.—*F. M. Blodgett.*

523. Carpenter, Ford A. Convectional clouds induced by forest fires. Monthly Weather Rev. 47: 143–144. *1 pl.* 1919.—Forest fires in southern California are frequently responsible for the formation of clouds, but none of these are known to have produced rain.—*E. N. Munns.*

524. Chase, Agnes. Some causes of confusion in plant names. Jour. Forestry 17: 159–162. 1919.—See Bot. Absts. 3, Entry 1808.

525. Clark, F. G. Appraisal of fire damage to immature timber for statistical purposes. Jour. Forestry 17: 36–38. 1919.—A formula is proposed for use in general studies of fire-damage over large areas. The general formula for replacement is modified (1) by reducing the cost of planting by a percentage represented by the proportion of artificial to natural reproduc-

tion based on experience, (2) by pro-rating the values for each age class for the different species, in accordance with present relative commercial values. An example is presented for northern Idaho and Montana.—*E. N. Munns.*

526. CLIFFORD, J. D. **Effect of thinning on a young teak plantation.** Indian Forester 45: 16–18. 1919.—An acre of 17-year-old teak, 30 feet in height, was thinned in 1913 and remeasured and compared with the check plot in 1918. The 5-year girth increment per tree amounted to 3.49 inches on the thinned area and 2.73 on the unthinned, the mean annual increment being 0.70 and 0.55 inches respectively. On the thinned plot eleven more trees attained a girth of two feet in five years than was the case on the unthinned, while the excess girth amounted to 272 inches. This first thinning took 40 per cent of the stems, while the second, in 1918, took 10 per cent of those remaining. Remeasurement is planned for 1923.—*E. N. Munns.*

527. CREMATA, MERLINO. **Cercas alambradas y setos en Cuba.** [Fences and hedges in Cuba.] Revist. Agric. Com. y Trab. 2: 259–272. *19 fig.* 1919.—Chapter one of this article gives a list of some sixty kinds of wood that make good posts. It includes a brief description of the tree and the wood, notes on distribution, history, nomenclature, etc. Chapter two deals in the same way with trees that may be planted as living posts.—*F. M. Blodgett.*

528. CREVAT, JULES. **Production d'une plantation de pins noirs d'Autriche.** [Yields from a plantation of Austrian pine.] Compt. Rend. Acad. Agric. France 1919: 32. 1919.—Brief note on the methods of establishing a plantation of Austrian pine and the yields to be expected from it.—*E. A. Bessey.*

529. D'ABOVILLE, P. **Détermination du diamètre au milieu du tronc de l'arbre sur pied.** [Determination of the diameter at the middle of the trunk of a standing tree.] Rev. Eaux et Forêts 57: 117–120. *2 fig.* 1919.—If d is the diameter of a tree at the height of the observers eye, d' the diameter at half the height of the tree, and f the coefficient of form, then $d' = df$. If the observer stands at a distance from the tree equal to half its height less the height of the eye above the ground, then $f = 1.4\,\frac{n'}{n}$, when n' and n represent, respectively, the apparent magnitudes of d' and d on a graduated scale held horizontally at arm's length. Having obtained f, the diameter at the middle-height of the tree, d', can readily be determined from the first formula given. Repeated tests have shown that satisfactory results may be secured by this method.—*S. T. Dana.*

530. DANA, S. T. **Floods and erosion.** Canadian Forestry Jour. 14: 159. April, 1919.—Examples are given of floods and erosion on watersheds where the timber cover has been denuded by destructive lumbering. Another example shows that since forest cover has become established floods and erosion have practically ceased.—*E. N. Munns.*

531. ECLEFIELD. **Kiefern-Harznutzung.** [Production of resin from Scotch pine.] Deutsch. Forstzeitg. 34: 22. 1919.—An experimental operation on 10.86 hectares at Eisenbach in Oberhesse, employing Scotch pine (*Pinus sylvestris*) 86 to 110 years old, yielded 1.37 kgm. of fluid per tree (299 trees per hectare). Gross returns, at 3 marks per kilogram, were 4.12 marks per tree, and expenses were 0.98 marks per kilogram or 1.35 marks per tree. Net return per hectare was 828.80 marks. On a level site the southwest side of the trees yielded the most resin; on a southeast slope, the east side yielded most. The yield was less on hot days and greater on warm, damp days.—*W. N. Sparhawk.*

532. FERNOW, B. E. [Rev. of: GILL, W. **Annual progress report upon state forest administration in South Australia, 1917–18.** Woods and Foreste Dept. *13 p.* 1918.] Jour. Forestry 17: 324–325. 1919.

533. FISCHER, C. **Das Verhalten der Sitkafichte in der Oberförsterei Rüdesheim, Bezirk Weissenthurm.** [Behavior of Sitka spruce.] Deutsch. Forstzeitg. 34: 69. 1919.—Sitka spruces (*Picea sitchensis*) planted in 1901 are now from 12 to 14 meters high, and others planted

in 1906 are from 7 to 8 meters high. Douglas fir has done nearly as well, and other American conifers have also given good results. Spruce has stood severe frosts without injury.—*W. N. Sparhawk.*

534. Fisher, M. L. **The washed lands of Indiana: A preliminary study.** Indiana (Purdue) Agric. Exp. Sta. Circ. 90. *24 p., 18 fig.* 1919.—See Bot. Absts. 3, Entry 467.

535. Flury, Phillipp. **Ueber Wurzelverwachsungen. [Natural root grafting.]** Schweiz. Zeitschr. Forstw. 70: 37–41. 1919.—Natural grafting of roots one or more centimeters in diameter was found to be as common as the natural grafting of stems and branches, but no grafting of smaller roots was found. In experiments, roots of spruce, pine, fir, beech, oak and ash have been held in contact under pressure since 1912, but no grafting has occurred.—The grafting of larger roots is explained by the fact that in these roots the cambium grows as in branches and stems and consequently permits of union of growing cells by division from the inside layer, while in the young root the growing cells divide in the outer layer and consequently cannot form a union. It is also pointed out that the grafting of absorption roots would be a disadvantage to the plant while the grafting of older roots would only tend to strengthen the system of support roots. Author remarks that nature has possibly provided the young roots with a repulsive power to react away from one another, as a stem is autotropic while a root is geotropic.—*J. V. Hofmann.*

536. Foster, J. H. [Rev. of Rankin, W. Howard. **Manual of tree diseases.** *398 p.* MacMillan Co., New York, 1918.] Jour. Forestry 17: 321. 1919.

537. Gutot, Ch. **Un projet de loi "tendant a la réorganisation générale de la police. [A proposed law for the general reorganization of the police.]** Rev. Eaux et Forets 57: 100–103. 1919.—The Minister of the Interior has asked all the municipal councils in France for suggestions on a proposed law which he plans to present to Parliament, transferring to the authority of the prefect the greater part of the police powers now exercised by the municipal authority in accordance with the law of April 3, 1884, and organizing a rural police to replace the present rural guards. The proposed law is of interest to foresters and forest owners because it would afford better protection to private forests than the present system.—*S. T. Dana.*

538. Gloyer, H. M. **Conversion of blue-pine forest to deodar in the Bashahr Division of the Punjab.** Indian Forester 45: 1–3. *Pl. 1–3.* 1919.—The rapid growth of deodar (*Cedrus deodara*) following the removal of blue pine (*Pinus excelsa*) is described.—*E. N. Munns.*

539. Grainger, M. A. **British Columbia reduces fire hazards.** Canadian Forestry Jour. 14: 152. April, 1919.—An abstract is given of the new fire law for British Columbia, together with a brief description of activities in that province.—*E. N. Munns.*

540. Hagem, Oscar. **Fremmede trāslag i vort lands skogbruk. [Exotic trees in our forests.]** Tidskr. Skoghruk 26: 363–375. *Fig. 1–4.* 1918. Calls attention to the need of more extensive experiments with exotic conifers, particularly those from the northwestern United States, Canada and the coast of Alaska. In these regions both temperature and precipitation appear to be similar to those pevailing on the west coast of Norway. Extensive experiments were begun by Börre Giersten in 1900–1903 with different exotics, but lack of knowledge of their requirements and the difficulty of obtaining different planting sites have frustrated most of the earlier efforts. The problem can only be approached, with any assurance of success, by sending some one abroad to collect seed and to study the climatic conditions and the distribution of the species intended for trial.—*J. A. Larsen.*

541. Hagem, Oscar. **Beretning fra vestlandets forstlige forsögsstation. [Report of the Western Forest Experiment Station.]** Tidsskr. Skogbruk 26: 392–395. 1918.—Anton Smitt was sent to the United States and Canada to collect tree seed for trial in Norway. Forty pack-

ages have been received. Many samples were sown in spring of 1917, with uniformly good germination. Those from the northwest coast of U. S. A. have shown considerable frost injury while those from northern British Columbia and from Alaska survived the first winter quite well.—The Bergen Experiment Station is conducting an extensive series of soil tests for the purpose of discovering the causes of failure of plantations on soil with heavy raw humus and on "fyng" ground. The 1918 station budget is given.—*J. A. Larsen.*

542. HASLUND, OVE. **Taksation i firmast Haaken Mathissen's Skoge.** [**Forest taxation on the holdings of Haaken Mathiesen.**] Tidsskr. Skogbruk 26: 380–385. 1918.

543. HAUGHTON, S. **Umbrella and baobab trees.** Ceylon Antiquary and Lit. Reg. 4: 171. 1919. Brief, non-technical note on the baobab (*Adansonia digitata*) south of Mannar Island, which, according to local tradition, was transplanted there by Arabs from the Red Sea, probably attracted by the pearl fishery. No reference is made to Watt's Dictionary (1: 105), who attributes the introduction of the tree into India to Arab traders.—*B. Laufer.*

544. HAWES, A. F. **Economic aspects of the wood-fuel campaign.** Jour. Forestry 17: 163–167. 1919.—The coal shortage and the winter of 1917–18 aroused much interest in the use of wood for fuel in U. S. A. A campaign to encourage this use was inaugurated and permanent results are looked for in the establishment of municipal forests, the creation of wood-markets on a coöperative basis, the establishment of standards of measurement and classification for fuel wood, an increased use of fuel wood and a greater general interest in woodland as a source of fuel.—*E. N. Munns.*

545. HEES. **Bombenwürfe in Kiefernbestande.** [**Effect of bombs on pine stands.**] Deutsch. Forstzeitg. 34: 35. 1919.—Describes damage done by airplane bombs in pine forests near Trêves Trier).—*W. N. Sparhawk.*

546. HOLE, R. S. **Notes from Dehra Dun Herbarium, No. IV. Cassia auriculata.** Indian Forester 45: 64–65. 1919.—A silvical distribution of a shrubby tree, the bark of great value for tanning.—*E. N. Munns.*

547. HOWE, C. D. **A land of forests—without forestry.** Canadian Forestry Jour. 14: 212–216. 1919.—Only 500,000 square miles of Canada is actually forest-producing, and half of this has been burned. Investigations show that the white pine stands are practically gone and that the tree is not being reproduced except on limited areas. In the spruce areas there is a reduction of two-thirds in the future growing stock, while in balsam stands the reduction is more than one-sixth. Patronage and the lack of proper management are responsible for these conditions, which can be remedied by recuperative forestry practices.—*E. N. Munns.*

548. HOWE, C. D. **Making of the spruce tree.** Canadian Forestry Jour. 14: 186. April, 1919.—White spruce has seed crops at intervals of from three to seven years, a fact ascribed to the use of large quantities of stored food, and to water conditions during the period between seasons. In many cases heavy yields extend uniformly over large areas.—*E. N. Munns.*

549. HUBAULT, E. **Une essence à grand rendement.** [**A species with large yield.**] Rev. Eaux et Forêts 67: 75–79. 1919.—Douglas fir (*Pseudotsuga douglasii* Carr.), because of the properties of its wood, its rapid growth, and its large yield, is a North American species of special interest for use in France. First introduced into Scotland during the first half of the last century it has proved successful there, in southwestern England, in Germany, and in France. Artificial stands do best on soils that are light, deep, and fertile, and poorly on either heavy clays or dry sands. The species is generally regarded by English foresters as preferring siliceous soils, although its aversion to calcareous soils has not been demonstrated. The "Pacific green" variety has done well in Scotland and northern England with an annual precipitation of from 25 to 33 inches, while the "Colorado blue" variety does well in drier climates. The former, which, because of its more rapid growth, is the preferred variety, needs

protection from violent winds and from early and late frosts, and is, therefore, often planted under a light cover. Plantations of this variety in the British Isles up to 60 years of age show a larger annual yield than plantations of larch, Sitka spruce, Norway spruce, or Scotch pine. In France this variety appears particularly adapted to the western part of the country, and can also be used in the Vosges region, but there on account of the danger from late frosts should be planted under a light cover. Judiciously employed, Douglas fir will furnish a larger yield than any other species that can be used in reforestation.—*S. T. Dana.*

550. Jobin, H. La forêt et le pâturage boisé a la Société Vaudoise des Forestiers. [Forest and pasture as discussed by the Vaud Society of Foresters.] Bull. Trimest. Soc. Forest. Franche-Comté et Belfot 13: 15–18. 1919.—Increased pasturage is essential for the quick reconstitution of cattle herds exhausted by the war. At the same time the forests ought not to suffer, hence the necessity for pasture-forests. These increase the revenue from the soil, create a cattle shelter and favor the desirable kinds of forage.—*S. T. Dana.*

551. Jolyet, A. Deux essences qu'il ne faudra pas oublier. [Two species that should not be forgotten.] Rev. Eaux et Forets 57: 93–99. 1919.—In restoring the forests in the area devastated by the war, species should be chosen which are of rapid growth and capable of furnishing usable products in a short period. On the other hand, in restoring portions of the forest in the midst of otherwise undamaged stands, the work should be conducted with a view to obtaining new stands as nearly as possible of the same type as those already existing. This means high forests of conifers in the Vosges mountains and coppice under standards in the greater part of the forests in the plains. In the Vosges plantations of the "green" form of Douglas fir are indicated. In the plains, black locust and white alder (*Alnus incona*) should be given careful consideration because of their rapid growth, ability to reproduce by suckers, and immunity from insect damage. White alder, while less known than black locust and producing a less valuable wood, is more tolerant, thrives in dry, calcareous soils, and suckers very abundantly. These, however, are not the two species referred to in the title of the article. From an economic point of view, it is essential to replace as quickly as possible the high forest trees which have disappeared, whether the coppice will recover naturally or must be replaced artificially. White (Weymouth) pine (*Pinus strobus*) and white poplar (*Populus alba*) are the two species particularly recommended for this purpose. White pine has a great advantage in being intermediate both in tolerance and in density of crown. If will come in naturally in the midst of broadleaf stands, and will also permit the establishment under its shade of such hardwoods as hornbeam, maple, ash, and even the common oak. It is well accommodated to the French climate, and will thrive on many soils. It is particularly suited for the formation of a high forest of conifers over a coppice of hardwoods, which is the only form of stand in which its use is recommended. This is because the tree must be allowed to reach fairly large size in order to form any considerable portion of heartwood, the sapwood being regarded practically as waste, during which time a return is yielded by the hardwood coppice; and because the white pine is nearly everywhere attacked by a fungus with a subterranean mycelium, the spread of which is prevented when the trees are grown far enough apart so that their roots do not come into contact with each other. White poplar has been looked upon somewhat askance because the abundant suckers which it produces have sometimes proved a nuisance in adjacent agricultural lands. These suckers would do no harm in the forests, where its use is recommended because of its rapid growth, coupled with the production of a merchantable wood which is among the best of the poplars. It is especially suited for use in naturally deep, fertile soils such as those formerly used for agriculture, but which have been so cut up by trenches and by shell holes as to be useless for cultivation for many years. The Japanese larch (*Larix leptolepis*) might also prove a desirable species to use along with white pine and white poplar, but not sufficient is known regarding its behavior in France to warrant too hearty endorsement.—*S. T. Dana.*

552. Judd, C. S. Forestry as applied in Hawaii. Hawaiian Forest. and Agric. 15: 117–133. May, 1918. This paper, originally delivered as an address, is divided into two parts; the first is a popular discussion of forestry in general and the second covers Hawaiian forestry

problems. Once heavily forested except on the lee slopes, these islands now have only 20 per cent of their area in forest. There are four general types of forest, the Algaroba (*Prosopis juliflora*) type, the Kukui (*Aleurites mollucana*) type, the Ohia lehua (*Metrosideros collina polymorpha*) type and the Mamani (*Sophora chrysophylla*) type. The Ohia lehua type serves merely as protection forest for agriculture and the next preceding and following types have large protective value, although they may be worked for their timber in a minor way. The Algaroba type alone is primarily timber-producing. Protection is a prime requisite because the irrigated sugar industry in the lowlands depends upon these rain forests. Cutting, but more particularly grazing, has caused the deterioration of the forests and their replacement by hilo grass. Methods of ridding the forests of this grass are discussed, and warning is sounded against wholesale importation of exotics which may prove worthless pests in Hawaii.—*F. S. Baker.*

553. KORSTIAN, C. F. **Life forms, leaf size and statistical methods in phytogeography.** [Rev. of: SMITH, WM. G. **Raunkiaer's life forms and statistical methods.** Jour. Ecol. 1: 16–26. 1913.] Jour. Forestry 17: 328–331. 1919.

554. KORSTIAN, C. F. **Root habits of trees in northern Canada.** [Rev. of: PULLING, HOWARD E. **Root habit and plant distribution in the far north.** Plant World 21: 223–233. 1918.] Jour. Forestry 17: 327–328. 1919.

555. LEE, Y. K. [Chinese] [Education in forestry.] Khu-Shou [Science, a publication of the Science Society of China] 4: 159–163. 1918.

556. LEVY, E. BRUCE. **Seed-testing.** New Zealand Jour. Agric. 18: 129. 1919.—The writer states that seed-testing has been established by the New Zealand Department of Agriculture for 10 years, although not yet compulsory. Two methods in common use, the continental method and the Irish method, are briefly compared. The Irish method is the one adopted in New Zealand and also in Great Britain. Theoretically the continental method is said to be more nearly correct but it is so laborious as not to be practical. A description of the New Zealand system follows in great detail, under the heads of: Process of germination, Purity analysis, Recording of progressive germination, Reporting and accounts.—*E. R. Hodson.*

557. MAHOOD, S. A. **The collection and some uses of the oleoresin of Douglas fir. (Oregon fir balsam, Douglas fir turpentine).** Amer. Jour. Pharm. 91: 345–349. *Pl. 1.* 1919.—The collection of the oleoresin of Douglas fir (*Pseudotsuga taxifolio*) is accomplished in one of two ways. By the first, or "draining," method the oleoresin is allowed to drain into suitable receptacles when the trees are felled. By the second, or "cruiser," method apertures are made in the "pockets" produced by wind shakes, when the oleoresin readily flows out.—A description of the methods employed for the collection of oleoresin from the European larch follows, which might presumably be applied to advantage in securing Douglas fir turpentine. By the European method, holes (about 1 to 1½ inches in diameter and a foot from the ground) are bored to the centre of the tree, in the spring. They are then plugged and in the autumn are opened and allowed to drain, or they may be left open from the first and allowed to drain into suitable receptacles. The author suggests the combination of the European method with the "cruiser" method. The remaining portion of the paper deals with the commercial uses of the various oleoresins.—*Anton Hogstad, Jr.*

558. MELROSE, G. P. **Red-belt injury in British Columbia.** Canadian Forestry Jour. 14: 164. April, 1919.—A Red-belt injury in Douglas fir is reported for the spring of 1916. This appears to have been caused by a sudden change in temperature during the time when the trees were unable to secure water from the frozen ground, or while portions of the trunk were frozen. No insect action yet noted in this connection.—*E. N. Munns.*

559. Mitchell, J. A. **Bear clover.** Jour. Forestry 17: 39–43. 1919.—A study of bear-clover (*Chamaebatia foliolosa*) on the Eldorado and Stanislaus forests [western U. S. A.] in 1912 indicates that forest reproduction is adversely affected by a bear-clover ground cover and that the relative percentage of incense-cedar reproduction increases, while that of pine reproduction diminishes, as the density of bear-clover increases. In extremely heavy stands all reproduction is excluded.—*E. N. Munns.*

560. Munns, Edw. N. **Some biological and economic aspects of chaparral.** Jour. Forestry 17: 9–14. 1919.—The relationship between chaparral and tree-growth in the transition belt in western U. S. A. is pointed out, with consideration of the bearing of the brush on the problem of forestation. By coppicing, chaparral forms a soil cover quickly after fire and it is valuable as a soil binder, preventing erosion and landslides. The economic value of chaparral is briefly discussed.—*E. N. Munns.*

561. Munns, Edw. N. **Women in southern lumbering operations.** Jour. Forestry 17: 144–149. 1919.—Owing to the shortage of labor in the South [U. S. A.] during the latter part of 1918, women undertook much work formerly done by men. Few positions in the woods, mill, or office were not occupied by women, who generally proved satisfactory.—*E. N. Munns.*

562. Myhrwold, Prof. **Skogkultur i Frankrike.** [French silviculture.] Tidskr. Skogbruk 27: 8–15. *Pl. 1–7.* 1919.

563. Nansen, Fritjof [and others]. **Frankrike-Norge-Skogen.** [France-Norway forests.] Tidskr. Skogbruk 27: 1–8. 1919. Original correspondence between the two governments relating to proposed plantations of Norway spruce in France by Norwegian foresters.—*J. A. Larsen.*

564. Pearson, G. A. [Rev. of: Hesselman, Henrik. Soil nitrification in relation to forest reproduction. Skogsvardsforeningens Tidskr. (Häft 1) *104 p.* 1918.] Jour. Forestry 17: 69–73. 1919.—Investigations of the absence of forest reproduction on the heath lands of northern Sweden showed that the chemical condition of the floor was of more importance than was soil moisture deficiency. Most of these forest soils are characterized by the fact that transformation of organic matter toward nitrates stops with the formation of ammonia. This is remedied by clear cutting or heavy thinning or by cultivation or burning. The result is due to the activity of bacteria which require salts for development. The condition of the soil may be determined by the vegetation cover, certain plants indicating nitrogen deficiency.—In America, the application of these findings is limited to the humid regions, and it is significant that heavy cutting and burning are practiced in the douglas fir region. In open yellow pine stands the soil has a deficiency of litter and humus, except under old trees, and reproduction occurring under such circumstances is due more to better moisture conditions than to improved chemical conditions of the soil. Lack of reproduction in these yellow pine forests is due to poor soil moisture conditions at a critical period in the life-history of the tree.—*E. N. Munns.*

565. Reckenagel, A. B. **Timber census in the northeastern states** [U. S. A.]. Jour. Forestry 17: 178–179. 1919.—A timber census was made of the northeastern states during 1918. The stand of spruce in New York is given as 3,500,000,000 feet. Other data are not yet compiled.—*E. N. Munns.*

566. Record, S. J. **Mahogany and some of its substitutes.** Jour. Forestry 17: 1–8. 1919.—A key is given embracing the woods known in the trade as "mahogany," or used as substitutes for the wood to which this name belongs. Representatives of 13 families and 27 genera are described. 11 genera belonging to the mahogany family, Meliaceae. The key is based on gross and lens characters. [See Bot. Absts. 2, Entry 748.]—*E. N. Munns.*

567. REED, GEORGE M. **Phytopathological survey of the trees and shrubs of Prospect Park and the Botanic Garden (Brooklyn). II. Report of the second season's work.** Brooklyn Bot. Gard. Rec. 7: 14–23. 1916.—Sect. Bo Absts. 3, Entry 785.

568. RICHARDSON, H. W. **The northeastern Minnesota forest fires of October 12, 1918.** Geog. Rev. 7: 229–232. *Figs. 1–5.* April [May], 1919.

569. ROWLEE, W. W. **Synopsis of the genus Ochroma, with descriptions of new species.** Jour. Washington [D. C.] Acad. Sci. 9: 157–197. 1919.—See Bot. Absts. 3, Entry 1335.

570. SCHWAB, W. G. **The forests of Dickenson County, Virginia.** Office of the State Forester, Bull. 17. *16 p., 6 pl., 1 folded map.* 1917.

571. SCHWAB, W. G. **The forests of Buchanan County, Virginia.** Office of the State Forester, Bull. 16. *20 p., pl. 2–3, 1 folded map.* 1918. [Reprinted from Virginia Geol. Surv. Bull. 18.]

572. SPÖRRI, EB. **Zur Gründung von Staatswaldbesitz im Kanton Zug. [Reason for state forests in the Canton Zug.]** Schweiz. Zeitschr. Forstw. 70: 41–43. 1919.—While state control of all industries tends to eliminate individual initiative, the control of industries which are vital to the state is necessary. The forest industry falls in the latter class, and the experience of other cantons led to purchase of forests in Zug in 1915 and 1916, and additions later. To date 92 hectares have been purchased, of which about 40 per cent is timbered land. The state control of forest will build up a state industry for the community where private control would not.—All European states own forests, and government control is receiving more and more attention in the United States on account of the destruction of the forests by private owners. —*J. V. Hofmonn.*

573. STECHER. **Bucheckernernte 1918. [Beechnut harvest of 1918.]** Deutsch. Forstzeitg. 34: 32–33. 1919.—Describes gathering of beechnuts in Cassel-Reinhardtswald. One village of 800 people gathered more than 400 centner (44,000 pounds). The nuts are used for food, being especially valuable under conditions existing at the time on account of their high oil content. Prices were as high as 150 marks per centner ($0.32 per pound). One hectaliter of fresh, dry nuts weighs 1 centner; after 10 days in a warm room there is a loss of weight of 11 kgm. and when completely dry a further loss of 2.5 kgm. With crude hand presses the nuts yield 14 per cent of their weight as oil.—*W. N. Sparhawk.*

574. SUNWORTH, GEO. B. [Rev. of: PEARSON, R. S. **Note on the preparation of turpentine, rosin, and gum from Boswellia serrata.** Indian Forest Rec. 6: 303–345. 1918.] Jour. Forestry 17: 322–325. 1919.

575. TAYLOR, N. **Effects of the severe winter (1917–18) on the woody plants of the Garden.** Brooklyn Bot. Gard. Rec. 7: 83–87. 1918.

576. TAYLOR, W. M. **The ailanthus-tree [Ailanthus glandulosa] for woodpulp.** New Zealland Jour. Agric. 18: 223. April 21, 1919.—Comment is made on an article by V. FEDELE (Monthly Bull. Agric. Intell. and Plant Dis. [Roma]). This tree, commonly known as "tree of heaven," has many qualities which fit it for pulp production. It is readily propagated by root cuttings and transplants well at any age. The growth is rapid, and it has the remarkable habit of making its strongest growth after pollarding. It is said that an acre of trees will yield approximately 25 tons of wood every third year. It thrives very well on every site in New Zealand, even on arid or very rocky soils. The wood yields 44 per cent of easily bleached cellulose, from which paper pulp can be made. Altogether it is considered a tree of great promise for the New Zealand paper industry.—*E. R. Hodson.*

577. TAYLOR, W. H. **Shelter belts.** New Zealand Jour. Agric. 18: 165. 1919.—This article deals with protective planting for orchards and states that quickness of growth is the chief consideration while the kind of trees obtainable is a secondary consideration. The

pines most used are, *Pinus radiata* (*insignis*) and *P. muricata*, of which the latter is the most valuable, as it retains its lower branches longer. Black wattle (*Acacia decurrens*) is recommended for certain localities. Where a high shelter is required with narrow limits, Lombardy poplar is regarded most suitable, especially when in combination with *Elaeagnus japonica*. North American species recommended are Gowen cypress (*Cupressus goveniana*), redwood (*Sequoia sempervirens*), Monterey cypress (*Cupressus macrocarpa*), and Lawson's cypress (*Chamaecyparis lawsoniana*), particularly the latter on account of its hardiness, wind resistance, low branching habit and rapid growth. A number of other species are described, and methods of treatment and spacing.—*E. R. Hodson.*

578. TOUMEY, J. W. **The relation of gray birch to the regeneration of white pine.** Jour. Forestry 17: 15–20. 1919.—Studies on plots of birch and pine in New Hampshire show that pure stands of birch (*Betula populifolia*) do not cause the death of white pine (*Pinus strobus*), though the rate of height growth of the white pine falls off rapidly with the increase in density of the birch stand. In general, the rate of height growth of the pine varies directly with the density of the stand of the birch, due more to root competition than to light relationships. Stands of birch can be planted without cutting of the pine until the birch can be utilized, or until the growth of the pine is measurably decreased.—*E. N. Munns.*

579. TOUMEY, J. W. [Rev. of: SAMPSON, A. W. **Effect of grazing upon aspen reproduction.** U. S. Dept. Agric. Bull. 741. 29 p. 1919.] Jour. Forestry 17: 564–567. 1919.—The duty of the forester is to care for forest reproduction and to grow successful crops of timber on forest land. Uncontrolled and unregulated grazing on such land has no place, but some grazing may be permitted.—*E. N. Munns.*

580. TOUMEY, J. W. [Rev. of: SAMPSON, A. W. **Climate and plant growth in certain vegetative associations.** U. S. Dept. Agric. Bull. 700. 1918.] Jour. Forestry 17: 59–62. 1919.

581. TURNER, E. PHILLIPS. **Reclamation of sand-dunes.** New Zealand Jour. Agric. 18: 148. 1919.—It is pointed out that the reclamation operations should begin at the source of the sand-drift (in case of coastal dunes this is high water mark), and that trees should not be planted until (1) a protective littoral dune has been raised, or (2) a belt along the coast has been planted to Marram brass (*Ammophila arenaria*). The French method of building a littoral dune by means of sand-catching fences is described and directions are given for planting marram. Tree planting is done only on the landward side, with the following species for New Zealand conditions: *Pinus radiata* (*insignis*), *Cupressus macrocarpa*, *Pinus muricata*, *P. thunderbergii* and *P. densiflora*. In order to secure hardy stock a local nursery is advised. When a protective coastal belt has been established by means of marram and trees, the remainder may be reclaimed by a less expensive method, though the use of tree-lupins followed by prairie grass, clovers, trefoils, danthonia, microlaena and cocksfoot.—*E. R. Hodson.*

582. VAN DISSEL, E. D. **Treatment of the dunes in Holland.** New Zealand Jour. Agric. 18: 150. 1919.—It is stated that the area of the dunes in Holland is 92,625 acres or about 1.15 per cent of the entire area. The method of fixation by planting marram grass (*Ammophila arenaria*) is described and the advantages of more permanent reclamation by means of afforestation are pointed out. Afforestation on the dunes of Schoorl, by the state, dates from 1865. In the early trials *Pinus laricio* var. *austriaca*, *P. montana*, *P. silvestris*, *P. maritima* and *Picea excelsa* were used. The first three species gave excellent results but *Pinus silvestris* succeeded only in sheltered places, while *Picea excelsa* and especially *Pinus maritima* were not successful. In 1893 new trials were made at the same place, in which *Picea alba* (used by Denmark and Jutland) was chiefly used, but it proves unsuited for afforesting the Dutch dunes. Subsequent work has been done with the successful species of the early trials, to which has been added *Pinus laricio corsicana*. *Pinus montana* is well suited to exposed sites, as it withstands violent winds and quickly covers the soil. Broad-leaved trees are used to some extent in the moist, sheltered places; alder and oak have given the best success. Difficulties encountered besides winds are included under damage by insects, fungi, fire and higher animals. The planting-stock used in this work should be raised in nurseries situated near or on the dunes.—*E. R. Hodson.*

583. VIARDIN, L. L'organisation forestiere, avant 1789, dans la Lorraine reconquise. [Forest organization in reconquered Lorraine prior to 1789.] Rev. Eaux et Forets 57: 80–85. 1919.—The first representative of the forest hierarchy in Lorraine was the *gruyer* (a lord having a right on the woods of his vassals), who is referred to in public documents as early as the first half of the fourteenth century. On April 20, 1464, the office of *grand gruyer* of Lorraine was established under which were a number of individual *gruyers*. The latter, assisted by a *contrôleur*, acted both as a forest administrator and forest accountant, designating the timber to be cut, receiving receipts, and collecting fines resulting from trespasses. Following the French occupation in 1681, Louis XIV abolished the *grueries* and the *Maitrise royale* of Metz became the headquarters of forest administration in Lorraine, while in 1686 the Duchies of Lorraine and Bar were divided into 13 individual *maitrises*. The *contrôleurs* of the former *grueries* were replaced by special *receveurs* charged exclusively with collecting the returns from the forest. With the end of the French occupation, this organization was in turn abolished by Duke Leopold who reestablished the *grueries* while retaining the special *receveurs*. The former, relieved of their accounting duties by the *receveurs*, frequently added the duty of provost to their other duties. In 1701, the duchies were divided into five forest departments, each in charge of a *commissaire réformateur*, to which a sixth was added in 1720. These *commissaires reformateurs* constituted a special chamber in charge of all questions relating to the management of the forests, including cuttings, clearings, and the exercise of rights of user. In 1720, this chamber was joined with the Council of Finances to form the Council of Finances and of Waters and Forests. In 1727, the *commissaires réformateurs* were given the title of *grands gruyers*. From the coming of Stanislas in 1737, it was the Council of Finance and Commerce which exercised complete authority in all forest questions. In reality however, the Council was controlled in forest matters by Paul-François Gallois, who after, some difficulty succeeded in substituting the French system of *maîtrises* for the former *grueries*. The reorganization was completed in 1747 when Lorraine and Barrois were divided into 15 *maitrises*. Each of these was in charge of a *maître*, who was generally assisted by a lieutenant, an agent of the king (who was concerned particularly in controlling rights of user), a hammer keeper, a surveyor, a clerk, and from 1 to 10 bailiffs. These offices were all purchasable and all hereditary. On the death of Stanislas in 1766, Lorraine was reunited to France, and became the nineteenth department of forests and waters, and in 1789 on the death of Claude-Nicolas Mathieu, who had been *grand maître* of Waters and Forests in the Duchies of Lorraine and Bar, that office was discontinued.—*S. T. Dana.*

584. WEIR, JAMES R., AND ERNEST E. HUBERT. The influence of thinning on western hemlock and grand fir infected with Echinodontium tinctorium. Jour. Forestry 17: 21–35. 1919.—Five plots aggregating 9.5 acres were laid out in the Priest River Valley, in Idaho, on potential timber land. The area was cut over in 1900 and 1902, and 57 hemlocks (*Tsuga heterophulla*) and 375 grand firs (*Abies grandis*) were growing in 1915. Following the cutting there was a decrease in the rate of diameter growth, due to opening the stand, followed by a decided increase in which hemlock took more part than did grand fir. With hemlock a marked second growth of the old crown took place, while with fir a secondary crown appeared on the lower trunk, in some cases extending nearly to the ground. The crown size of the trees in the cut-over area averaged 185 per cent greater than that of those of the virgin stand. The mean annual diameter growth on the cut-over area was found to be 143 per cent greater for hemlock and 176 per cent greater for grand fir, than was the case with the same species on the uncut area. While the injuries caused by logging were severe, there was a greater proportion of healed wounds on the cut-over area than on the uncut area. In general a less favorable set of conditions for fungous activity existed on the cut-over area; the total numbers of infected trees, of sporophores, and of sporophore-bearing trees, on the cut were less than on the uncut area. This is probably due to the removal of the infected trees on the former area. The thinning exerts a restrictive influence on *Echinodontium tinctorium*, due to better growing conditions for the trees, increased light and amelioration of stagnant-air conditions.—*E. N. Munns.*

GENETICS

GEORGE H. SHULL, *Editor*.

585. ADAMI, I. G. **Medical contributions to the study of evolution.** *xviii + 372p.* Duckworth: London, 1918.—This volume of lectures and addresses is divided into three parts. The first part, on adaptation and disease, contains the author's Croonian Lectures before the Royal College of Physicians in 1917. These lectures contain an epitome of the author's views on present evolutionary problems, and are particularly valuable for their numerous references to the data of variability and mutation in bacteria and the origin of zymotic diseases. Among the main points emphasized are the phenomena of "direct adaptation" in bacteria, numerous cases being cited in support of this view, some of which are difficult to explain on any other basis. A broad discussion of antitoxins, acquired immunity and related problems leads to a neo-Lamarckian position, based also upon experiments on intoxication of germ cells, etc. Chapter VI discusses "The physico-chemical basis of immunity and of evolution," and develops the conception, long since expressed by Adami, of the "biophoric molecule" as a proteidogenous unit having "vital and heritable properties" and composed of rings or chains of amino-acids, with a "nucleus" composed of a central amphoteric glycocoll group, to which are attached varying orders of side chains. This conception is applied in some detail to such phenomena as growth, enzyme action and anaphylaxis. These lectures contain vigorous attacks upon the Batesonian and Weismannian positions.—In parts II and III are reprinted articles and addresses published or delivered on both side of the Atlantic. Under the general headings "Heredity and adaptation" and "Growth and overgrowth" are included such diverse topics as variability in bacteria, inheritance of acquired conditions in man, inflammation, liquid crystals, Weismannism, classification of tumors, and various aspects of cancerous growths. This book serves to emphasize the reviving interest in neo-Lamarckianism on a physico-chemical basis.—*R. R. Gates.*

586. ANONYMOUS. **Disease resistance in plants.** Gard. Chron. 65: 192. Apr. 19, 1919.—Discussion of current hypotheses of the physiology of disease resistance.—*John Bushnell.*

587. ANONYMOUS. **Self-sterility in fruit trees.** Gard. Chron. 64: 238. Dec. 14, 1918.—Editorial review of: SUTTON, IDA. Report on tests of self-fertility in plums, cherries, and apples at the John Innes Horticultural Institution. Jour. Genetics 7: 281-300. 1918.—*John Bushnell.*

588. ANONYMOUS [J. F.] **Variability in plants.** Gard. Chron. 65: 285-286. June 7, 1919.—See Bot. Absts. 3, Entry 973.

589. ANONYMOUS [J. F.] **Variability in plants.** Gard. Chron. 65: 321. June 28, 1919.—See Bot. Absts. 3, Entry 974.

590. ANONYMOUS. **Inheritance studies with poultry at the Rhode Island Agric. Experiment Station.** Bull. Rhode Island State College 13: 41-42. 1918.—See Bot. Absts. 3, Entry 1470.

591. ANONYMOUS. **Six hundred twins already discovered.** Jour. Heredity 10: 210. May, 1919.

592. ANONYMOUS. **The inheritance of blindness.** Jour. Heredity 10: 211. May, 1919.

593. ANNY, A. C., AND H. K. HAYES. **Experiments in field technique in plat tests.** Jour. Agric. Res. 15: 251-262. 1918.—See Bot. Absts. 3, Entry 976.

594. BATESON, W. **Studies in variegation. I.** Jour. Genetics 8: 93-99. *Pl. 3-4, 1 fig.* April, 1919.—Reports bud variations on variegated plants giving branches, leaves, and sectors of leaves (1) pure green, (2) pure white, and (3) with reversal of green and white layers of cells. Reversals giving green-skinned sports on white-skinned chimaeras are described for

Euonymus japonicus latifolius var. *variegata*, and for three varieties of *Pelargonium*. The white-skinned and green-skinned varieties of *Coprosma Baueri* are described. The various sports are illustrated by 16 excellent figures in color, and one text figure shows the distribution of chlorophyll-and non-chlorophyll-bearing cells in *Euonymus*. Reversals in periclinal chimaeras are considered to be rare and due to some instability in the growing point, such as a greater vigor of the green core, or to injury.

Author suggests that the phenomena of reversal in variegated periclinal chimaeras may be duplicated in respect to somatic and genetic distinctions in characters not thus visible, thereby bringing about changes in the properties of the layer from which germ cells arise.—*A. B. Stout.*

595. BATESON, W., AND IDA SUTTON. **Double flowers and sex linkage in Begonia.** Jour. Genetics 8: 199–207. *Pl. 8.* June, 1919.—See Bot. Abstr. 3, Entry 978.

596. BEAUVERIE, J. **Les méthodes de selection appliquées aux céréales de sémences. État actuel de la question.** [**Methods of selection applied to seed grains. Present status of the matter.**] Rev. Gén. Sci. Pur. et Appl. 30: 79–87, 108–114. 1919.—Summarising the work of Hiffen, Nilsson, and others, author points out that the method of selecting the best seeds, year after year, of a mixture of strains seldom leads to the establishment of a superior variety with any degree of permanence, the quality of the seeds produced varying from year to year according to weather, cultural, and other conditions, with an undue proportion of inferior seeds in each crop. On the other hand, selecting from the progeny of a single individual, that is, in a "pure line" or in "pedigreed" stock, one has the chance of finding strains which will be permanently superior, year after year. In these strains some characters are fixed, such as the shape, color, and roughness of the grains; some vary with the conditions, such as length of stems, and weight of grains, though being more or less controlled by heredity; while still others vary entirely with the conditions of culture. But in the pure line the behavior of the individual as influenced by circumstances is not necessarily repeated in its own descendants, the behavior of the latter being controlled by its ancestors. There are doubtless many "pure lines" in nature, not recognized or recognizable. Occasionally one of these may "sport" or mutate, in a striking and desired manner, or a striking and desired change may come about by accidental crossing. Man takes advantage of the possibility of crossing, and by deliberate hybridising may secure a new and desired combination of characters already existing, such as superior fecundity with disease resistance, resistance to cold, etc. The paper also includes an historical sketch of the development of plant breeding through pedigree cultures at seed-control stations in various countries of the world, recognition of the leaders, and a statement of some of their main results.—*G. J. Peirce.*

597. BENSAUDE, MATHILDE. **Recherches sur le cycle évolutif et la sexualité chez les Basidiomycètes.** [**Researches on the evolutive cycle and sexuality in the Basidiomycetes.**] *156 p., pl. 1–3, fig. 30.* [Dissertation.] Nemours, 1918.—"Miss Bensaude has investigated *Coprinus fimentarius*, *Armillaria mucida*, and *Tricholoma nudum*. The work includes two phases: (1) the morphology and cytology of the mycelia, and (2) the results obtained from the study of the single spore cultures of *C. fimentarius*.—The mycelia of the 3 species were obtained from germinating spores as well as from material collected in the field. The author accepts Falck's classification of the mycelia into primary, secondary, and tertiary forms. The claim is made that the first few days after the germination of the spores the resulting mycelia belong to the primary class, in which the hyphae are partioned off into cells which contain from one to many nuclei. These uninucleate cells may give rise to varying numbers of uninucleate oidia. Disarticulated hyphal cells, which she calls "pseudoidia," are also formed which, like true oidia, may germinate. The nuclei in the germ tubes divide amitotically. Cross-walls with clamp connections never appear in the hyphae of the primary mycelia. Miss Bensaude grew single spores of *C. fimentarius* in pure cultures, and succeeded in isolating 10 single spores. Of these, 4 germinated, and in 2 cultures primary mycelia were obtained which did not produce carpophores. When parts of each mycelium were mixed in a culture, a secondary mycelium

appeared and fruit bodies were produced. The chief method of bringing about the plasmogamy is through the *union of* a hyphal cell of one thallus with an oidium from another thallus. Miss Bensaude concludes that the "dicaryo" in *C. fimentorius* is formed following plasmogamy between cells coming from two different thalli.—The transformation of a primary mycelium into a secondary mycelium is very difficult to observe. This is brought about by the anastomosis of 2 hyphal cells of different thalli in *C. fimentarius*. The fusion of 2 such cells (plasmogamy or pseudogamy) introduces the cytoplasm and nucleus or nuclei of one cell into the other, which results in the establishment of a binucleate cell. If 2 cells unite which have more than 2 nuclei in common, all disintegrate but 2. The uninucleate oidium may fuse with a hyphal cell, and this is a very common means of bringing about the initial binucleate condition of the cell.—Each cell in these secondary hyphae is binucleate, constituting a "dicaryon." Conjugate nuclear division occurs in these hyphae as a rule in the apical cell, although intercalary cells divide occasionally. At the time of division the 2 nuclei move to the middle of the cell, and the actual process of cell division is preceded by the formation of a protuberance which is to form a clamp. One of the nuclei which Miss Bensaude calls (+) on the basis of her results with single spore cultures, enters this very short branch, and the (−) nucleus remains at about the same level in the mother cell. Spindles are formed and conjugate nuclear division takes place. One of the (+) daughter nuclei goes back into the mother cell, and the other goes to the apex of the young clamp. A cross-wall cuts off the beak cell from the mother cell. Of the 2 (−) daughter nuclei, one goes to the apical part of the mother cell and the other to the basal part, and a cross-wall is formed at the level of the young clamp, dividing the cell into an apical portion with (+) and (−) daughter nuclei and a basal cell with only the (−) daughter nucleus. The little beak now fuses with the basal cell, and its nucleus passes into this cell, so that it also becomes binucleate. Very often the apex of the beak fuses with the mother cell before nuclear division takes place.—Reversion of secondary to primary mycelium occurs, in which case a uninucleate cell appears among binucleate cells. No clamps are found on the cross-walls of this cell, and these uninucleate cells may bear oidia." [Through rev. in Bot. Gaz. 68: 67–68. July, 1919.] See also Bot. Absts. 3. Entries 347 and 644.—*Michael Levine.*

598. Boulenger, G. A. **L'évolution est-elle réversible? Considérations au sujet de certains poissons.** [Is evolution reversible? Considerations relating to certain fishes.] Compt. Rend. Acad. Sci. Paris 168: 41–44. 1919.—Conclusions regarding relationships of groups have often rested on belief that evolution never reverses itself. Author believes such reverses have occurred. In fishes of family Cichlidae primitive teeth were undoubtedly conical. Many African members have hi- er tri-cuspid teeth, and in some of them conical and hi- or tri-cuspid mixed. Young fishes, however, have hi- or tri-cuspid teeth, older ones conical, indicating that evolutionary trend is now back toward conical shape. Concludes also that in evolution of this family the number of vertebrae was reduced to about 24, but subsequently increased to 30 or more in African forms whose dentition is aberrant, thus constituting another reversal. Other more obscure evidences of reversal of evolution are found in same family.—*A. Franklin Shull.*

599. Boulenger, G. A. **Un cas d'évolution ontogénique à rebours chez un lézard africain (Eremias lugubris A. Smith).** [A case of reversed ontogenetic evolution in an African lizard.] Compt. Rend. Acad. Sci. Paris 168: 78–80. 1919.—These lizards descended from striped ancestors, and adults are striped at present. Some young, however, show stripes broken up into spots, which later elongate and unite to form stripes. Is regarded as case of reversed ontogeny. Author speculates also concerning purpose of jet black and bright color-pattern of young, as compared with gray and pale yellowish and tan of adult, so similar to desert regions, but reaches no conclusion.—*A. Franklin Shull.*

600. Boveri, Theodor. **Zwei Fehlerquellen bei Merogonieversuchen und die Entwicklungsfähigkeit merogonischer und partiellmerogonischer Seeigelbastarde.** [Two sources of error in investigations of merogony and the ability of merogonic and partially merogonic sea-urchin hybrids to develop. Arch. Entwicklungsmech. Organ. 44: 417–471. 3 *pl.* 1918.—Unfinished

posthumous article, pointing out two facts which help explain conflicting results of echinoderm crosses. First, whole eggs or egg fragments which have been taken and appear to have no nuclei may contain chromatin of nucleus in irregular mass not recognizable in living protoplasm; and this chromatin is capable of normal participation in development. Second, nucleus may be divided into two or more partial nuclei, probably due to failure of chromosome vesicles to coalesce at proper stage in reconstruction of nucleus. These two discoveries are used to explain facts taken from literature and from new experiments. Egg fragments of *Sphaerechinus* apparently without nuclei, fertilized by sperm of *Paracentrotus* [*Strongylocentrotus*), yielded some paternal larvae (as previously reported), but majority were intermediate larvae. But intermediate larvae had large nuclei, hence were diploid, for author confirms former conclusion that nuclear size is safe criterion of haploid or diploid number of chromosomes. Egg fragments in these cases must have contained nuclei. Disappearance of nucleus on shaking occurs only in young eggs, probably just after polar-body formation. In fully ripe female only few eggs are in this stage, while nuclei of older eggs resist disintegration on shaking. One supposedly merogonous larva from *Sphaerechinus* × *Paracentrotus* (female named first) was nearly paternal. It had smaller nuclei than genuine hybrids, but not small enough to be haploid. Author concludes egg fragment contained only partial nucleus. Some larvae of same cross were maternal, and these have been shown to be plainly haploid. In one set of crosses *Sphaerechinus* × *Parechinus* (*Echinus*) many larvae died early; these were probably haploid. Those that lived longer were probably not haploid, yet some were paternal. However, crosses involving whole egg of *Sphaerechinus* are sometimes paternal. Suggests that when "merogonous" larvae were paternal egg fragment contained partial nucleus, and that these maternal chromosomes helped develop larva to pluteus stage at which paternal characters could appear. Godlewski's merogonous *Parechinus* × *Antedon* crosses gave some maternal embryos, but author suspects egg fragments contained nuclei; nuclear size was not determined in these larvae.—Some larvae have nuclei of haploid size on one side, diploid size on other. These are attributed to partial merogony, dispermy in which one sperm nucleus fuses with egg nucleus, other functions alone. In partial merogonous larvae of crosses *Sphaerechinus* × *Paracentrotus* and *Sphaerechinus* × *Parechinus* diploid and haploid cells migrate and mix, making certain characteristics intermediate. If two cleavage spindles resulting from dispermy be placed, not parallel, but perpendicular to one another, all micromeres, and hence mesenchyme, might be diploid. One merogonous larva appeared to be in this condition, its gut and mesenchyme being diploid and its skeleton normal. Some doubtful cases are described.—Author suggests two stages of development, early stage in which any chromosomes will suffice for development, later stage in which right interchromosomal combination must be present, as well as mutually compatible cytoplasm and chromosomes. Explains why hybrids between *Sphaerechinus* and either *Paracentrotus* or *Parechinus* can be paternal only when maternal nucleus is also present: maternal nucleus is necessary in order that development may proceed into second stage when paternal characters can appear. Nucleus is not, however, merely organ to insure development: giant eggs formerly shown, in crosses, to produce more nearly maternal embryos than did normal eggs in similar crosses owed that property to their double nuclei. Moreover, hybrids from egg fragments were not less like mother than were hybrids from whole eggs, as they would be if cytoplasm determined characters.—*A. Franklin Shull.*

601. BRIDGES, CALVIN B. **The genetics of purple eye-color in Drosophila melanogaster.** Jour. Exp. Zoöl. 28: 265–305. May 20, 1919.—Purple is an early mutation (found Feb. 20, 1912) that has proved especially useful. It is strictly recessive, easily and rapidly separable from wild-type, fully viable, fertile, and productive. Its locus is in second chromosome 6.2 units to right of black, or 52.7 to right of star. This is middle of second chromosome as mapped, and apparently also in actuality, since this region is characterised by abnormally high double crossing over, special sensitivity to action of age, heat, and cold upon amount of crossing over, and by special limitation upon action of certain genetic crossover variations. Purple has been involved in development of many important fields of *Drosophila* genetics: with vermilion it gave "intensification" or "disproportionate modification." It has

been model for repeated "mimic" mutations and has itself been "recurrent." Purple was used most extensively in early analysis of autosomal linkage—coupling F_2, back-cross test of crossing over in both male and female, two-point map, three-point map, etc. Coincidence curve for age-variation in crossing over is roughly mirror image of crossover curve for age-variation, while coincidence curve for temperature-variation in crossing over seems to be straight line independent of temperature curve of crossing over. Age and temperature variations in crossing over seem therefore to depend on two different physiological factors affecting respectively "internode length" and "coefficient of crossing over."—*Calvin B. Bridges.*

602. Bridges, Calvin B. **Specific modifiers of eosin eye color in Drosophila melanogaster.** Jour. Exp. Zoöl. 28: 337–384. July 5, 1919.—See Bot. Abstr. 3, Entry 2092.

603. Bridges, Calvin B. **Vermilion-deficiency.** Jour. Gen. Physiol. 1: 645–656. July 20, 1919.—See Bot. Abstr. 3, Entry 982.

604. Brown, N. E. **The defertilization of flowers by insects.** Gard. Chron. 63: 4. 1918. —Author observed a Syrphid fly eating the pollen from anther and stigma of a *Pelargonium* flower.—*John Bushnell.*

605. Cox, H. S. **Origin of the Georgia and Alabama varieties of velvet bean.** Jour. Amer. Soc. Agron. 10: 175–179. *2 fig.* 1918.—See Bot. Abstr. 3, 1471.

606. Collins, E. J. **Sex segregation in the Bryophyta.** Jour. Genetics 8: 139–146. *Pl. 6, 8 fig.* June, 1919.—See Bot. Abstr. 3, Entry 2103.

607. Collins, G. N. **Intolerance of maize to self-fertilization.** Jour. Washington, D. C., Acad. Sci. 9: 309–312. June 4, 1919. Of several hundred strains of maize (*Zea*) which have been repeatedly self-fertilised only one has been discovered which does not suffer a loss of vigor in consequence.—This intolerance of self-fertilisation is difficult to reconcile with the flowering habits of maize, most varieties of which are synœmic or slightly proterandrous. It is pointed out that a slight departure from synœmy toward proterogyny would not only increase the chances for cross-fertilisation, but would also insure complete fertility when climatic conditions were unfavorable for the distribution of pollen.—An explanation of the combination of synœmy with an intolerance to self-fertilization is suggested by the idea of the hybrid origin of this species. *Euchlaena* the nearest relative of maize and generally regarded as an ancestor shows no measurable reduction of vigor as a result of self-fertilization. It must be assumed therefore that the intolerance of self-fertilization is a character derived from some source other than *Euchlaena*. It does not seem unreasonable to suppose that the ancestor possessing this intolerance would have also some means of insuring cross fertilisation. Perfect-flowered spikelets and androgynous inflorescences of maize are proterogynous. The sexes, however, are normally separated, the male inflorescence occupying a terminal and the female inflorescence a lateral position on the plant. Terminal inflorescences mature before lateral and the delay attendant on a lateral position neutralizes the natural proterogyny. The conclusion is reached that the unknown ancestor of maize was perfect-flowered and was protected from self-fertilisation by complete proterogyny. While maize retains the intolerance of self-fertilization of this perfect-flowered, proterogynous ancestor the protective proterogyny is lost through the separation of the sexes, a characteristic derived from *Euchlaena*.—*J. H. Kempton.*

608. Connors, C. H. **Methods in breeding peaches.** Proc. Amer. Soc. Hortic. Sci. 14 (1917): 126–127. 1918.—Early attempts in trying to cross peaches when paper bags were used, proved practically negative. Mosquito netting shows slightly better results, but not entirely satisfactory. Later attempts were made to enclose entire tree with cheese cloth supported on framework, with quite satisfactory results.—Object was to study inheritance of size of blossoms. It was first thought that size of blossom might be due to hybridization, but is now known that all sizes are found in the wild forms in China. Crosses and selfings were made.

Early freestones and semi-clings give about 10 per cent from stone to tree, later freestones give, up to 50 per cent.—Total of 403 trees of known parentage were planted in spring of 1916, and 1073, in 1917. No method is yet devised to secure F_1 generation. [See Bot. Absts. 2, Entry 724.]—*C. E. Myers.*

609. COULTER, MERLE C. Inheritance in Pediastrum. [Rev. of: HARPER, R. A. Organization, reproduction, and inheritance in Pediastrum. Proc. Amer. Phil. Soc. 66: 375–439. *Pl. 5–6, fig. 84.* 1918.] Bot. Gaz. 67: 513–514. June, 1919.—Many complexities occur in reproductive processes of flowering plants, and reviewer conceives that studies on lower organisms promise to have profound bearing on theoretical genetics. He thinks however that the peculiarities of *Pediastrum* make doubtful the applicability of author's conclusions to higher plants, though he sees that there may be something comparable between the method of colony formation in *Pediastrum* and the arrangement of nuclei in early stage of embryo formation in gymnosperms and arrangement of nuclei in the embryo-sac of angiosperms.—*G. H. Shull.*

610. COULTER, MERLE C. Mendelian inheritance in gamstophytes. [Rev. of: TRANSEAU, EDGAR NELSON. Hybrids among species of Spirogyra. Amer. Nat. 53: 109–119. *Fig. 7.* 1919. (See Bot. Absts. 2, Entry 715.)] Bot. Gaz. 67: 514–515. June, 1919.—Reviewer considers behavior of gametophyte generation one of most critical tests of current theoretical mechanism of inheritance, and thinks the lower plants especially favorable material for such studies. Predicts that segregation will be found taking place in the first generation and there should be no dominance. Transeau's studies were purely observational but are taken to agree with this expectation. Reviewer hopes that the author will find means of studying the hybrid *Spyrogyras* "under rigid experimental control."—*G. H. Shull.*

611. COULTER, MERLE C. A corn pollinator. Bot. Gaz. 68: 63–64. *1 fig.* July, 1919.—See Bot. Absts. 3, Entry 989.

612. COULTER, MERLE C. A new conception of sex. [Rev. of: JONKE, W. N. On the nature of fertilization and sex. New Phytol. 17: 167–188. 1918.] Bot. Gaz. 68: 68–69. July, 1919.

613. COULTER, MERLE C. Self-sterility. [Rev. of: EAST, E. M., AND J. B. PARK. Studies on self-sterile plants. II. Pollen-tube growth. Genetics 3: 353–366. *3 fig.* 1918.] Bot. Gaz. 68: 70–71. July, 1919.

614. COWGILL, H. B. Cross-pollination of sugar cane. Jour. Amer. Soc. Agron. 10: 302–306. 1919.—See bot. Absts. 3, Entry 2106.

615. COWGILL, H. B. Studies in inheritance in sugar cane. Jour. Dept. Agric. Porto Rico 2: 33–41. 1918.—See Bot. Absts. 3, Entry 2107.

616. DAHLGREN, K. V. OSSIAN. Erblichkeitsversuche mit einer dekandrischen Capsella bursa-pastoris (L.) [Genetical experiments with a decandrous Capsella bursa-pastoris.] Svensk. Bot. Tidsskr. 13[1]: 48–60. *2 fig.* 1919.—The author relates some results obtained by crossing a constant type of *Capsella bursa-pastoris* having petals transformed into stamens, with *Capsella Heegeri* and two of Almquist's "elementary species" of *C. bursa-pastoris* (viz., *C. collina* and *C. emarginata*).—Apetalous forms are not a uniform race. The apetaly can be produced either by abortion of the petals or by their transformation into stamens. By unfavorable nourishment petals and stamens sometimes disappear and real female flowers (fertile) may be obtained.—In F_1 the apetalous type prevails, but small petals or intermediate forms between petals and stamens are seen. In F_2 segregation takes place according to the proportion 3 : 1, if we consider apetalous individuals (*EE*) and heterozygotes (*Ee*) as one group. These two categories are rather difficult to separate. In some families the number of individuals with petals was too great. This might be caused by foreign seeds in the soil.—

By crossing with *C. Heegeri*, a segregation concerning capsule form took place in the proportion 15 : 1, as has been first observed by Shull. If *Ee* and *EE* [in original paper by a mistake these were written *Ee* and *ee*] are considered as one group, the segregation will be 45 : 15 : 3 : 1. Results were as follows:—

	Obtained	Calculated
C. bursa-pastoris apetala	298	288.98 ± 9.26
C. bursa-pastoris normalis	96	96.33 ± 8.59
C. Heegeri apetala	14	19.27 ± 4.29
C. Heegeri normalis	3	6.42 ± 2.51

Many disappointing crossings were made between *Capsella grandiflora* and other *Capsella* forms. A flowering F_1 plant has perhaps been produced; this one however did not give any seeds. [See Bot. Abstr. 3, Entry 1473.]—*K. V. Ossian Dahlgren.*

617. Danforth, C. H. Evidence that germ cells are subject to selection on the basis of their genetic potentialities. Jour. Exp. Zoöl. 28: 385–412. July 5, 1919.—See Bot. Abstr. 3, Entry 990.

618. Dehaut, E. G. Développement en sens inverse de la coloration verte, chez Lacerta muralis tiliguerta et L. mur. quadrilineata. [Development of green coloration in reverse direction in Lacerta muralis tiliguerta and L. m. quadrilineata.] Compt. Rend. Soc. Biol. France 82: 514–515. May 17, 1919.—See Bot. Abstr. 3, Entry 1474.

619. Dehaut, E. G. Interversion d'un caractère cranien dans certaines races du Sus scrofa. [Interversion of a cranial character in certain races of Sus scrofa.] Compt. Rend. Soc. Biol. France 82: 515–516. May 17, 1919.—See Bot. Abstr. 3, Entry 1475.

620. Delphin, L. [Rev. of: Downing, Elliot R. The third and fourth generation. An introduction to heredity. *164 p., 13 fig.* University of Chicago Press: Chicago. 1918.] Rev. Gén. Sci. Pure et Appl. 30: 58. 1919.

621. Doncaster, L. Note on an experiment dealing with mutation in bacteria. Proc. Cambridge Phil. Soc. 19: 209. 1919.—See Bot. Abstr. 3, Entry 823.

622. Dorsey, M. J. A note on the dropping of flowers in the potato. Jour. Heredity 10: 226–228. *Fig. 19.* May, 1919.

623. Drieberg, C. A freak papaw (Carica Papaya). Jour. Heredity 10: 207. May, 1919.

624. Duerden, J. E. Crossing the North African and South African ostrich. Jour. Genetics 8: 155–198. *Pl. 7, 2 fig.* June, 1919.—See Bot. Abstr. 3, Entry 2118.

625. Edmonds, M. E., and P. Sargeant. Variability in plants. Gard. Chron. 65: 299. June 14, 1919.—See Bot. Abstr. 3, Entry 993.

626. Enriques, Paola. [French rev. of: Maiocco, F. L. Le leggi di Mendel e l'eredità [Les lois de Mendel et l'hérédité]. [Mendel's law and heredity.] *282 p.* Fratelli Bocca: Torino, 1918.] Scientia 25: 510–511. 1919.

627. Falck, K. De första grunderna av ärftlighetslära. [On the first principles of genetical science. *85 p.* Stockholm, 1919.—Small pamphlet written for use in schools.—*K.V. Ossian Dahlgren.*

628. Faure, Ch. Note sur un cas d'hermaphroditisme rudimentaire chez le coq. [Note on a case of rudimentary hermaphroditism in the cock.] Compt. Rend. Soc. Biol. France 82: 519–520. May 17, 1919.—See Bot. Abstr. 3, Entry 1480.

629. FREEMAN, GEO. F. **Heredity of quantitative characters in wheat.** Genetics 4: 1–93. Jan., 1919.—Number of reciprocal crosses were made between an Algerian white macaroni wheat, an Algerian red bread wheat, and two white bread wheats, Early Baart and Sonora. All facts observed on inheritance of date of first head, height of plant, width of broadest leaf, are in harmony with hypothesis of segregation of a number of simple Mendelian unit characters. Constants employed to measure variability were standard deviation of time of heading and coefficient of variation of height and leaf width.—All crosses produced normal F_1 plants usually somewhat above average in size. Sterile seeds and plants and vegetatively deficient plants occurred in F_2 and F_3 of macaroni-bread wheat crosses, probably the results of recombination of Mendelian unit factors. If blending inheritance occurred, F_1 would have shown abnormality. In nearly all crosses, the behavior of F_3 cultures from selected F_2 plants indicated clearly the existence of genetic differences in F_2 explainable only as the result of recombination of several unit factors.—Heterozygosity in F_2 and F_3 of the macaroni-bread wheat crosses is shown by marked greater variability in hybrid populations. Differences in variability between F_2 and F_3 show increasing homozygosity in F_3.—In size characters, macaroni-bread wheat crosses gave hybrids less in average size than parents but much greater in variability. Bread wheat hybrids were intermediate or greater in size but no more variable than parents. Tall and wide-leaved cultures from genetically equivalent hybrid groups and from pure lines as well were uniformly less variable than short and narrow-leaved cultures. Some suppression factor appears to reduce variability in races with high means resulting from increased vegetative growth. Size factors seem to produce greater variability in combinations producing results below the mean of the hybrid population. This effect suppressed nearly all extra variability due to heterozygosity in the bread wheat hybrids. Recent literature is reviewed.—*Breeze Boyack.*

630. FREEMAN, G. F. **A mechanical explanation of progressive changes in the proportion of hard and soft kernels in wheat.** Jour. Amer. Soc. Agron. 10: 23–28. 1918.—See Bot. Absts. 3, Entry 2125.

631. GOONSPEEN, T. H., AND PIRIE DAVIDSON. **Controlled pollination in Nicotiana.** Univ. California Publ. (Bot.) 5: 429–434. 1918.—See Bot. Absts. 3, Entry 998.

632. GOWEN, J. W. **Inheritance studies of color and horn characteristics.** Maine Agric. Exp. Sta. Bull. 272. *127–148 p., 4 fig.* 1918.—See Bot. Absts. 3, Entry 999.

633. HARLAND, S. C. **Tomato breeding in St. Vincent.** Agric. News Barbados 17: 4–5. 1918.—St. Vincent native tomato is perennial, grows very vigorously and produces smooth, regularly shaped fruits about 1½ inches in diameter. Fruits contain many seeds and are very acid in taste. This native variety is unaffected by "Blossom-end rot" although sometimes attacked by the bacterial disease due to *Bacterium solonacearum.*—F_1 and F_2 crosses between native variety and Ponderosa have been studied. The F_1 generation proved uniform. Quality of fruit and fruit size were intermediate between the parents. F_1 fruits were slightly subject to "Blossom-end rot." In F_2 segregation occurred for all differential characters. There was an enormous range of sizes and shapes of fruits although no plant produced fruit as large as Ponderosa or as small as the native variety. Segregation occurred for habit of plant and quality of fruit.—Many F_2 plants were attacked by "Blossom-end rot" while others were apparently immune to this affection. Some plants were more resistant to the disease caused by *B. solanaceorum*, than others, although none were immune.—*H. K. Hayes.*

634. HARRISON, J. B. **Seedling sugar canes.** Internat. Sugar Jour. 20: 558–560. 1918. Also: same title. Agric. News Barbados 17: 289–290. 1918.

635. HENDRICKSON, A. H. **Five years results in plum pollination.** Proc. Amer. Soc. Hortic. Sci. 15 (1918): 65–66. 1919.—Work covers a period of five years involving 100,000 hand-pollinations to determine effect of selfing and crossing, and more than 175,000 blossoms were counted to secure per cent of set under normal orchard conditions. Results were consistent

for the various years of the test. Of the eight varieties of the Japanese type studied, seven were self-sterile, and one partly self-fertile. Of the nine varieties of the European type studied, three were clearly self-sterile and the others were somewhat uncertain. Varieties of each type effectively cross-pollinate one another when respective blossoming periods are coincident. [See Bot. Absts. 2, Entry 727.]—*C. E. Myers.*

636. Hunter, Capt. H. **The improvement of the barley crop.** Jour. Dept. Agric. Ireland 19: 139–159.. *Fig. 1–11.* 1919. The greater part of this paper is a description of methods for performing (1) a progeny performance-test of pure lines derived from commercial varieties of barley and (2) the extraction of desirable commercial types from crosses of strains containing valuable characters of which a recombination is desired. Selected cases of improved pure lines of Archer and Goldthorpe varieties isolated in the progeny performance-test are cited. The hybridization work consists of crosses of Archer, Goldthorpe and Spratt varieties of barley. Selections of plants carrying a recombination of the two parent types were made and tested for length of straw, yield and nitrogen content. Photographs and descriptions of isolated strains which proved worthy are given. In a cross of Archer × Spratt, the broad- and narrow-eared character is followed through three generations. The broad-eared type behaves as a recessive to the narrow-eared.—*John W. Gowen.*

637. Jones, W. N. **On the nature of fertilization and sex.** New Phytol. 17: 167–188. 1918.—See Bot. Absts. 3, Entries 612, 1486.

638. Jordan, David Starr. **War and genetic values.** Jour. Heredity 10: 223–225. May, 1919.

639. Kempton, J. H. **Inheritance of waxy endosperm in maize.** U. S. Dept. Agric. Bull. 754. *99 p., 14 fig.* June 26, 1919.—See Bot. Absts. 3, Entry 2154.

640. Kottur, G. L. **Note on protecting the cotton flowers from natural crossing.** Poona Agric. Coll. Mag. 9: 131–132. *3 fig.* 1918.—See Bot. Absts. 3, Entry 2156.

641. Kraus, E. J., and H. R. Kraybill. **Vegetation and reproduction with special reference to the tomato (Lycopersicum esculentum).** Oregon Agric. Exp. Sta Bull. 149. *90 p., 22 fig.* 1918.—See Bot. Absts. 1, Entry 1402; 3, Entry 1488.

642. Lankester, Sir Ray. **The terminology of parthanogenesis.** Quart. Jour. Microsc. Sci. 63: 531–536. Apr., 1919.—See Bot. Absts. 3, Entry 1010.

643. Laughlin, H. H. **Population schedula for the census of 1920.** Jour. Heredity 10: 208–210. May, 1919.

644. Levine, Michael. **Life history and sexuality of Basidiomycetes.** [Rev. of: Bensaude, Mathilde. **Recharches sur le cycle évolutif et la sexualité chez la Basidiomycètes.** [Researchas on the evolutive cycle and sexuality in the Basidiomycetes.] *156 p., pl. 1–3, fig. 30.* [Dissertation.] Nemours, 1918. [Bot. Absts. 3, Entry 597.] Bot. Gaz. 68: 67–68. July, 1919.

645. Lombarteix, Jean Marie. **Les sémis comme moyan de combattra la dégénérescence de la pomma de terre.** [Seeds as means of combatting degeneration in the potato.] Rev. Hortic. 90: 170. Oct., 1918.—Author states that in France the old varieties of potatoes are degenerating. Not only is yield reduced but the plants are becoming more susceptible to disease. This degeneration is attributed to continued vegetative propagation which results in reduction of vigor and consequent loss of disease resistance. It is held that, in all species which may be propagated by both seeds and cuttings, seedlings are more vigorous than plants propagated vegetatively.—It was found that vigor, yield and disease resistance were restored completely by using for seed potatoes the tubers produced by plants grown from seed. The varietal characteristics of the potatoes secured by this method closely resembled those of the parental variety.—*J. H. Kempton.*

646. LOVE, H. H., AND W. T. CRAIG. **Methods used and results obtained in cereal investigations at the Cornell Station.** Jour. Amer. Soc. Agron. 10: 145–157. *1 pl., 1 fig.* 1918.—See Bot. Absts. 3, Entry 2163.

647. LOVE, H. H., AND W. T. CRAIG. **Fertile wheat-rye hybrids.** Jour. Heredity 10: 195–207. *11 fig.* May, 1919.

648. LUNDBORG, H. **Rasfrågor i modern belysning. Populär handledning under medverkan av fackmän utgiven av. [Race questions in modern light. A popular manual issued in association with other specialists.]** *VI + 144 p.* P. A. Norstedt & Söners: Stockholm, 1919.—This work was published in connection with an exhibition of Swedish racial types and contains the following treatises:

(1) O. ALMGREN. On the origin of the Swedish people in light of the prehistorical remains.

(2) G. BACKMAN. On the origin of the Swedish people and its genetical constitution according to anthropology.

(3) R. NORDENSTRENG. On Finlanders and Lapponians.

(4) E. HILLERSTROM. On walloons and their descendants in Sweden.

(5) H. VALENTIN. On the Jews in Sweden.

(6) A. THESLOFF. On gypsies and "tattare."

(7) N. v. HOFSTEN. On heredity in the light of modern science.

(8) H. LUNDBORG. On augenical ideas and essays of our time.

(9) H. LUNDBORG. On the mixing of races and marriages between relatives from a biological view.—*K. V. Ossian Dahlgren.*

649. MACOUN, W. T. **Apple breeding in Canada.** Agric. Gaz. Canada 5: 126–128. 1918.—Summarizes apple breeding in Canada, most of which has been carried on since 1890. At the Central Experimental Farm 115 new varieties have been named. A number of seeds were planted in 1898 which were saved in an orchard containing 400 to 500 named varieties. Seeds were saved from those varieties which were most promising. Of 1211 seedlings, which have borne fruit, 378 are worthy of further trial. Some crosses made by Dr. Wm. Saunders proved more hardy than any other varieties of apples or crabs yet tested. Some of the hardier of these have been recrossed with named varieties of apples with the hope of obtaining hardier varieties with larger fruit. Seed was sown in 1910 from hardiest Russian apples and 75,000 seedlings are being tested for hardiness at the Dominion Experimental Farms in the prairie provinces.—Conclusions regarding method of origination of new varieties are given. Two methods are favored: (1) Sow seeds of varieties which most nearly approach the desired characters. Save seeds, if possible, from an orchard containing several varieties, which have the desired characters, as natural crossing will give many combinations. (2) Crossing of known varieties which most nearly approach the desired characters. The Siberian crab apple (*Pyrus baccata*) crossed with the apple should give hardier apple varieties.—*H. K. Hayes.*

650. MAIOCCO, F. L. **Le leggi di Mendel e l'eredità. [Mendel's law of heredity.]** *222 p.* Fratelli Bocca: Torino, 1918.—See Bot. Absts. 3, Entry 626.

651. MEYER, A. W. **The occurrence of superfoetation.** Jour. Amer. Med. Assoc. 72: 769–774. 1919.—See Bot. Absts. 3, Entry 1497.

652. MOORE, CARL R. **On the physiological properties of the gonads as controllers of somatic and psychical characteristics. II. Growth of gonadectomized male and female rats.** Jour. Exp. Zoöl. 28: 459–467. *1 fig.* July 5, 1919.—See Bot. Absts. 3, Entry 1499.

653. MORGAN, T. H., AND CALVIN B. BRIDGES. **The inheritance of a fluctuating character.** Jour. Gen. Physiol. 1: 639–643. *2 fig.* July 20, 1919.—See Bot. Absts. 3, Entry 1016.

654. Murray, J. G. **Relation of the supplying ovary to the causation of sex.** Johns Hopkins Hosp. Bull. 29: 275–278. 1918.—This paper is a criticism of the theory advanced by E. Rumley Dawson (The causation of sex in man) "that a male foetus is due to fertilization of an ovum that came from the right ovary, and a female foetus is due to the fertilization of an ovum that came from the left ovary." In criticising the examples given by Dawson in proof of his theory, Murray shows that only four of them fulfill the conditions necessary to make them convincing. Murray then tests from the 17,500 deliveries at the Johns Hopkins Hospital the 75 cases in which it is possible to determine absolutely from which ovary the ovum came, and he finds that male and female children result in about equal numbers from the fertilization of ova from each ovary. He then tests in 40 cases of repeated pregnancies Dawson's rules for predicting the sex of an unborn child and finds that they work in exactly 50 per cent of the cases, which is, of course, the number that would be expected by chance. Murray therefore concludes that the supplying ovary has no influence upon the sex of the child.—*Sylvia L. Parker.*

655. Norton, J. B. **Washington asparagus: information and suggestions for growers of new pedigreed rust-resistant strains.** U. S. Dept. Agric. Bur. Plant Ind. Cotton, Truck, and Forage Crop Diseases Circ. 7. *8 p.* Feb. 15, 1919.—During the past thirteen years there have been developed, through the coöperative efforts of the Massachusetts Agric. Exp. Sta. and the U. S. Bur. Plant Ind., high-yielding pedigreed strains of *Asparagus* resistant to rust, *Puccinia asparagi* De C. Of these the most satisfactory and widely distributed strains are "Mary Washington," "Martha Washington," "Washington Stock," and "Martha Washington Stock." This circular gives briefly the origin and main descriptive characters of each, together with advice to growers as to methods of cultivation, marking, further selection and breeding of these strains. Bur. Plant Ind. does not distribute seeds or roots of these strains but will furnish names of reliable growers from whom they may be obtained.—*Maude Muller.*

656. Norton, J. B. S., and C. E. Leathers. **Conditions detrimental to seed production.** Maryland Agric. Exp. Sta. Bull. 216. *p. 175–226.* 1918.—Authors discuss factors detrimental to development of seeds and reviews much of previous work on question. Rules for raising good seed are given and troubles of each crop, and control methods, are taken up specifically. Extensive bibliography is included.—Results of original investigations and observations are given as follows:—Variation in infection with septoria on tomato seedlings gives promise for selection in leaf-blight resistance. Seed from green tomatoes will germinate but the greener the seed the longer before germination. Seeds from tomatoes immature when leaves were killed by frost October 14, germinated well when taken from field up to November 9. They withstood a number of heavy frosts and temperatures as low as 15° F. Seeds from tomatoes ripened and rotted in field gave lower percentage of germination than when ripening and rotting process took place in laboratory. Viability of tomato seeds was not affected by 5-days' fermentation in pulp but more than this caused decrease in vitality. Blackening of seeds dried on copper wire did not affect vitality. Some lots of cabbage seeds treated with corrosive sublimate and formaldehyde for disinfection, developed growth of fungi which interfered with growth of seedling when germinated in sterile tubes on synthetic agar. Seedlings without fungus grew freely. Cabbage seeds were injured by water at 52°C. for 20 minutes. In process of disinfection with hot water, 4-year-old seeds were injured at lower temperatures than 2-year. Fresh, half-grown cowpeas will germinate but resulting seedlings are slender and slow-growing. In open fields lightly infested with winter cress, largest and earliest-blooming plants were in center of area occupied by mother plant previous year. Authors believe larger seeds fall nearest mother plant. [See Bot. Absts. 1, Entries 628, 747; 2, Entry 730; 3, Entry 276.]—*Fred Griffee.*

657. Page, E. Judson. **Variability in plants.** Gard. Chron. 66: 10. July 5, 1919.—See Bot. Absts. 3, Entry 1022.

658. PLATE, L. **Vererbungsstudien an Mäusen.** [Inheritance studies on mice.] Arch Entwicklungsmech. Org. 44: 291–336. 5 *fig.* 1918.—Author presents results of studies on sable and piebald patterns in mice. He concludes that the sable pattern is due to a mutation of the factor for yellow. He finds that sables, like yellows, are always heterozygous, that they often change into yellows in the course of their life and that they frequently produce or are produced by yellows. He considers that the yellows in these cases really possess the factor for sable but that the production of black pigment is inhibited by independent modifiers. He finds that heterozygous chocolate and pink eyes have modifying influences of this kind. The agouti factor is represented as independent of the black-yellow-sable series (y, Y, Y^y). He finds that white spotting is recessive to self-color in agreement with other work, but that the progeny of two piebald mice may have either more or less white than either parent. He believes that his results can be explained by means of multiple factors without assuming either factor inconstancy or contamination.—*Sewall Wright.*

659. PLOUGH, HAROLD H. **Linear arrangement of genes and double crossing over.** Proc. Nation. Acad. Sci. [U. S. A.] 5: 167–168. May, 1919.—Plough has demonstrated that crossing over varies with temperature and probably with other environmental factors. Bridges had shown that crossing over varies with age. These influences, very marked for short regions, gradually vanish as distance increases. This must mean that double crossing over is increased proportionally more than single crossing over—which can actually be demonstrated if intermediate points are followed, but remains undetected if they are not. On theory of linear linkage, double crossing over is not, as Castle claims, "unproved hypothesis," but absolutely required by evidence. Castle's theory would necessitate assumption that long chromosomal "distances" are less affected by environment than short ones.—*Alexander Weinstein.*

660. RABAUD, ÉTIENNE. **Évolution et sexualité.** [Evolution and sexuality.] Scientia 25: 275–287. 1919.—Problem of sexuality is physico-chemical, not morphological. Sex and sexual reproduction may be influenced by external factors, or by internal features such as chromosomes; action is physiological in either case. Hermaphroditism implies sexuality, may be more recent than separation of sexes, and requires no special explanation. Regarding utility of sexual reproduction, author rejects rejuvenescence theory, including production of favorable recombinations (Jennings). Sees no connection between parasitic or sedentary modes of life and sexuality. Evolution occurred before sexuality existed, hence evolution by recombination can not be any great advantage. Sexuality arose as result of exchanges between living matter and external influences. Species thus becoming sexual continued to live, not because sexuality brought them any advantage, but because it did them no harm. Or, if some species were thereby injured, they perished.—*A. Franklin Shull.*

661. REED, H. S. **Growth and variability in Helianthus.** Amer. Jour. Bot. 6: 252–271. 9 *fig.* June, 1919.—See Bot. Abstr. 3, Entries 1028, 1029.

662. SAGE, E. JUDSON. **Variability in plants.** Gard. Chron. 65: 308. June 21, 1919.—See Bot. Abstr. 3, Entry 1023.

663. SCHACKE, MARTHA A. **A chromosome difference between the sexes of Sphaerocarpostexas.** Science 49: 218–219. Feb. 28, 1919.—See Bot. Abstr. 3, Entry 1034.

664. SCHMIDT, JOHS. **Racial studies in fishes. II. Experimental investigations with Lebistes reticulatus (Peters) Regan.** Jour. Genetics 8: 147–153. 1 *graph.* June, 1919.—See Bot. Abstr. 3, Entry 2191.

665. SNYDER, H. **Wheat breeding ideals.** Jour. Amer. Soc. Agron. 10: 113–119. 1918.—See Bot. Abstr. 3, Entry 2199.

666. STURTEVANT, A. H., C. B. BRIDGES, AND T. H. MORGAN. **The spatial relations of genes.** Proc. Nation. Acad. Sci. [U. S. A.] 5: 168–173. May, 1919.—In Castle's three-dimensional diagram [see Bot. Abstr. 2, Entry 658] only a few loci lie outside a single plane. These excep-

tions are due in part to Castle's use of data that are not significant because of the small number of individuals involved, or because particular characters were sometimes not distinguishable, etc. In part also they are due to his use of data derived from different experiments and hence not safely comparable, where the result turns on very small differences, because of the variation of crossing over values due to genetic differences, environment, age, and differential viability.—Where data are derived from same experiment (i.e., where genes are all followed in the same individuals) arrangement of loci is always in a straight line provided that distances involved are short enough to allow no double crossing over. Since entire X chromosome of *Drosophila* can be mapped by combining overlapping segments which are themselves straight lines, arrangement of loci is necessarily represented by a single straight line.—In Castle's diagrams the genes which are located on the basis of sufficient data are all arranged approximately in a line—only the line (if he had drawn it) would be curved. This curvature is due merely to existence of double crossing over. Apparent distance between widely separated loci is less than distance obtained by summating the intermediate segments, because double crossing over is not detected when only two loci are followed. Where double crossing over is followed, the total distance is always sum of component distances; i.e., arrangement is a straight line.—Occurrence of double crossing over between widely separated loci explains why observed crossover values have not exceeded 50 per cent.—Castle is unwilling to admit existence of double crossing over; but his attempt to explain small size of smallest classes by single break fails, because combinations of characters impossible on Castle's scheme have already been reported. Castle's own hypothesis to account for double crossing over is inconsistent with his representation of distances as proportional to crossover values. Moreover, even if Castle's scheme had successfully weathered double crossing over, it would fail to deal with triple crossing over, of which many cases have been found.—*Alexander Weinstein.*

667. Tedin, H. **Växtförädling.** [Plant improvement.] Den mindre jordbrukarens handbok XXXVII-XXXVIII. Stockholm, 1919.—Contains information about the theory and importance of genetical science, written for farmers.—*K. V. Ossian Dahlgren.*

668. Thompson, J. Arthur. [French rev. of: Newman, H. H. **The biology of twins (mammals).** (Biologie des jumeaux (Mammifères).) *186 p., 56 fig.* University of Chicago Press: Chicago, 1917.] Scientia 25: 511-513. 1919.

669. Whiting, P. W. **Genetic studies on the Mediterranean flour-moth, Ephestia kühniella Zeller.** Jour. Exp. Zoöl. 28: 413-445. *2 pl., 1 fig.* July 5, 1919.

670. Whitney, David D. **The ineffectiveness of oxygen as a factor in causing male production in Hydatina senta.** Jour. Exp. Zoöl. 28: 469-492. July 5, 1919.—Food of these rotifers was in all cases green flagellate *Chlamydomonas.* All rotifers were reared in mass cultures from which random collections were taken to determine sex ratio. Fewer males were produced in sunlight than in darkness, reversing results of former experiments. Reversal is attributed to fact that in former experiments *Chlamydomonas* was artificially kept active, whereas in present experiments it was allowed to settle on glass and become less available for food. In some experiments oxygen was measured and found to be more abundant in sunlight (2 to 15 cc. per liter) than in darkness (2 to 8 cc. per liter). In other experiments in which oxygen was allowed to dissolve from the air in some cultures but was excluded from others, same proportion of male-producers was obtained in each. General conclusion is that oxygen is not a factor affecting sex. Paper contains brief criticism of methods and conclusions of Shull and of Shull and Ladoff.—*A. Franklin Shull.*

671. Witte, H. **Über weibliche Sterilität beim Timotheegras (Phleum pratense L.) und ihre Erblichkeit.** [On female sterility in timothy (Phleum pratense L.) and its inheritance.] Svensk Bot. Tidsskr. 13[1]: 32-42. *2 fig.* 1919.—In a pedigree of an isolated *Phleum pratense* at Svalöf author has found several plants which did not produce any seeds, as the female organs were rudimentary. Exceptionally however a single seed could be found. The normal plants produced in average 4895 ± 260 seeds, and the male ones only 1.7 ± 0.92 seeds per indi-

vidual. The length of spikes and culms was the same in both categories. In all 43 normal and 19 female plants were secured, which indicates a monohybrid segregation (calculated, 46.50 : 15.50). Also in the next generation male individuals were found among the few plants which came to flower.—*K. V. Ossian Dahlgren.*

672. WOODS, FREDERICK ADAMS. **Portraits of early Americans.** Jour. Heredity 10: 212-222. *Fig. 13-18* May, 1919.

HORTICULTURE

J. H. GOURLEY, *Editor*

673. ANDAS, J. W. **The cultivation of chicory.** Jour. Dept. Agric. Victoria 17: 113-116. *Fig. 1.* 1919.—Method of cultivation practised for chicory (*Cichorium intybus*) are given. The seeds are planted in September and roots dug in March.—*J. J. Skinner.*

674. ANDAS, J. W. **An economic plant. The Jerusalem artichoke. [Helianthus tuberosus.]** Jour. Dept. Agric. Victoria 17: 246-248. *Fig. 1.* 1919.—The artichoke is suitable to a variety of soils, its cultivation and economic value is discussed, and its composition given.—*J. J. Skinner.*

675. BERRY, JAMES B. **Trees, their use and abuse.** Georgia State Coll. Agric. Bull. 162. *19 p., 18 fig.* 1919.

676. CHASE, W. W. **Common insects and diseases of the apple.** Georgia State Bd. Entomol. Bull. 54. *51 p., 18 pl., 28 fig.* 1919.—See Bot. Absts. 3, Entry 748.

677. DARROW, GEORGE M. **Currants and gooseberries.** U. S. Dept. Agric. Farmers' Bull. 1024. *40 p., 26 fig.* 1919.

678. FARRELL, J. **Apple culture in Victoria.** Jour. Dept. Agric. Victoria 17: 145-157. *Pl. 6.* 1919.—See Bot. Absts. 3, Entry 758.

679. FREE, MONTAGUE. **Effect of low temperatures on greenhouse plants.** Brooklyn Bot. Gard. Rec. 8: 14-17. Jan., 1919.—Gives experience of Brooklyn Botanic Garden conservatories during the unusually severe winter of 1917-1918, accompanied by abnormal shortage of coal.—*C. S. Gager.*

680. GUNDERSON, A. J. **The pruning of winter-injured peach trees.** Illinois Agric. Exp. Sta. Bull. 218: 383-394. *Fig. 1-15.* 1919.—The extent of winter injury of peach trees and the factors affecting severity of injury are discussed. The experimental work was confined to 3, 4, and 5-year old, winter-injured Elberta peach trees. The trees were pruned with varying degrees of severity and observations were made as to the effect of such pruning on the growth and on the bud formation. Moderate pruning gave best results.—*M. J. Prucha.*

681. HOLLINGSHEAD, R. S. **Chemical analyses of logan blackberry (loganberry) juices.** U. S. Dept. Agric. Bull. 773. *18 p.* 1919.—"The juices of berries grown in Washington and Oregon differ markedly in composition from those of fruit produced in California. There is also a very large variation in the composition of juices from fruit grown in the various parts of these states. This is probably due to the fact that in the northern section the berries are grown under heavy rainfall, whereas the land in California usually is irrigated. Apparently California juices have a somewhat higher ash content and a lower acid content than the juices from the more northern states. Observations extending over several seasons would, of course, be necessary to confirm this apparent difference."—*Author's summary.*

682. Holmes, Arthur D. **Digestibility of some by-product oils.** U. S. Dept. Agric. Bull. 781. *16 p.* 1919.—"The coefficients of digestibility of the by-product oils (98.4 per cent for apricot-kernel, 98 per cent for cherry-kernel, 98.2 per cent for cantaloupe-seed, 96.6 per cent for peach-kernel, 98.2 per cent for pumpkin-seed, and 95.8 per cent for tomato-seed oil) indicate that these oils are very well assimilated by the [human] body and possess a nutritive value equal to that of other better known edible oils, such as cottonseed, corn, peanut, cocoanut, soybean, and olive oils."—*Author's summary.*

683. Hou, I. P. [Chinese.] **[Plant oils in China.]** Kbu-Shou [Science, a publication of the Science Society of China] 4: 321–325, 448–459. 1919.—Seventeen different plant oils are briefly discussed as regards chemical composition, physical properties, and uses in China. Descriptions of the plants, as well as their distribution, are included, together with methods of extraction of oils (in some instances).—*D. E. Lee.*

684. Johnson, James. **The influence of heated soils on seed germination and plant growth.** Soil Science 7: 1–103. *Pl. 1–8.* 1919.—See Bot. Absts. 3, Entry 854.

685. McHatton, T. H., and H. W. Harvey. **Peach growing in Georgia.** Georgia State Coll. Agric. Bull. 169. *38 p., 11 fig.* 1919.—History of *Prunus persica* in Georgia with general cultural and handling directions. Commercial varieties recommended, Mayflower, Greensboro, Carman, Waddell, Hiley, Belle, Elberta and Fox.—*T. H. McHatton.*

686. Pickett, B. S. **Some soil treatments for mature apple orchards.** Illinois Agric. Exp. Sta. Circ. 233. *6 p., 3 fig.* 1919.—The cultivation, mulching, and fertilizing the soil in old apple tree orchards are discussed and the benefits therefrom emphasized.—*M. J. Prucha.*

687. Prescott, Edward E. **The Australian flora from an ornamental aspect.** Jour. Dept. Agric. Victoria 17: 183–187, 242–245. *Pl. 3.* 1919.—A description of the ornamental plants of Australia is given.—*J. J. Skinner.*

688. Wallis, E. **Pear growing in Victoria.** Jour. Dept. Agric. Victoria 17: 76–86, 207–216. *Pl. 16.* 1919.—See Bot. Absts. 3, Entry 869.

689. Zee, T. N. [Chinese.] **[Some ancient works on agriculture.]** Kbu-Shou [Science, a publication of the Science Society of China] 4: 269–273. 1918.

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

690. Campbell, Douglas Houghton. **Mosses and ferns.** 3d ed. *8vo, 708 p.* Macmillan Co.: New York, 1918.—New edition revised and brought up to date, includes investigations based on collections of tropical liverworts and ferns, especially from the Indo-Malayan region. A large appendix, taking into account the more recent investigations in the field covered by the book, has also been added.—*E. W. Sinnott.*

691. Engler, Arnold. **Tropismen und excentrisches Dickenwachstum der Bäume. Ein Beitrag zur Physiologie und Morphologie der Holzgewächse. [Tropisms and eccentric thickening in trees. A contribution to the physiology and morphology of woody plants.]** Preisschr. Stiftung Schnyder von Wartensee 21: 1–106. *14 pl., 16 fig.* Beer and Co.: Zürich, 1918.—Detailed field notes and stem analyses bearing upon the general form and eccentricity of trees growing on steep slopes and in other abnormal positions, with special reference to heliotropism, geotropism, and the effects of longitudinal compression upon the cambium. The author concludes that there is very little difference between the structure of the so-called

"compression wood" and normal wood of dicotyledons. The geotropically produced wood of ring-porous dicotyledons, on the other hand, is characterized by possessing relatively more "latewood" and wider vessels than normal tissue. The structural changes which occur during geotropic and heliotropic bending are briefly discussed. [See Bot. Abstr. 3, Entry 826.] —*I. W. Bailey.*

692. GARBER, R. J., AND P. J. OLSEN. **A study of the relation of some morphological characters to lodging in cereals.** Jour. Amer. Soc. Agron. 2: 173–187. *Fig. 1–8.* 1919.—See Bot. Abstr. 3, Entry 468.

693. PARROTT, P. J., H. E. HODGKISS, AND F. Z. HARTZELL. **The rosy aphis in relation to abnormal apple structures.** New York Agric. Exp. Sta. [Geneva] Tech. Bull. 66. 29 p., 8 *pl.* (3 *colored*), 6 *fig.* 1919.—See Bot. Abstr. 3, Entry 783.

MORPHOLOGY AND TAXONOMY OF ALGAE

J. R. SCHRAMM, *Editor*

694. BRISTOL, B. MURIEL. **On the retention of vitality by algae from old stored soils.** New Phytol. 18: 92–107. *Fig. 1–3.* 1919.—Fifteen samples of soil from the experimental plots at Rothamsted (England), which had been sealed at various times from 1846 to 1893, were examined for living algae. A culture fluid was inoculated with the soils in 1916. After a short time green algae developed, and later blue green. The identification of species was rendered difficult by the fact that most of the forms appearing in cultures were not exactly identical with known species. Notes of each species mentioned record these variations from the type. In the following list of species, the numbers following each name indicate (1) the number of samples from which it was recovered, and (2) the number of years it lived in dry soil. *Nostoc muscorum* Kütz. (7–70), *N. Passerinianum* Bornet et Thuret (1–59), N. sp. (3–59), *Anabaena laxa* (Rabenh.) A. Br. (?) (2–46), *A. oscillarioides* Bory forma (4–59), *Nodularia Harveyana* (Thwaites) Thuret (1–70), *Cylindrospermum licheniforme* (Bory) Kütz. (2–59), *Plectonema Battersii* Gomont (4–47), *Hapalosiphon flexuosus* Borzi forma (?) (4–47), *Phormidium tenue* (Menegh.) Gomont (1–47), *Trochiscia aspera* (Reinsch) Hansg. (4–48), *Chlorococcum humicola* (Naeg.) Rabenh. (11–59), *Stichococcus bacillaris* Naeg. (3–48), *Nitzschia Palea* (Kütz.) W. Sm. (1–48).—A new variety (*terrestris*), with two new forms (*major* and *minor*) of *Anabaena oscillarioides* Bory is described.—The degree of dryness of the stored soil appears to affect the longevity in some cases.—*I. F. Lewis.*

695. CARTER, NELLIE. **Trachelomonas inconstans, a new flagellate.** New Phytol. 18: 118–119. *Fig. 1.* 1919.

696. GROVES, JAMES. **Notes on Lychnothamnus.** Jour. of Bot. 57: 125–129. 1919.—The author discusses a charophyte raised from mud collected in Cape Colony, and concludes that it is *L. macropogon*, Braun, an Australian species, heretofore not known from Africa. The status of the generic name *Lychnothamnus* is discussed, it being shown that *L. macropogon*, a somewhat transitional species, may be treated in one of four ways: it may remain in *Lychnothamnus*, be placed in *Lamprothamnium*, be separated in a genus *Macropogon* or be reinstated in *Chara*. The author, after discussion, prefers the last alternative. Incidentally the new combination *Nitellopsis obtusa* (Desv.) is made for *Lychnothamnus stelliger* Braun.—*K. M. Wiegand.*

697. HAUMAN, L. **Notes floristiques. Quelques cryptogames, gymnospermes et monocotilédones de l'Argentine.** [Floristic notes. Some Argentine cryptogams, gymnosperms and monocotyledons.] An. Mus. Nacion. Hist. Nat. Buenos Aires 29: 391–444. *Pl. 1–4, fig. 1–3.* 1917.

698. Smith, Gilbert Morgan. **A second list of algae found in Wisconsin lakes.** Trans. Wisconsin Acad. Sci. 19: 614–653. *Pl. 10–15.* 1918.—The present paper is a continuation of the author's studies on Wisconsin algae (see Smith, G. M. **A preliminary list of algae found in Wisconsin lakes.** Trans. Wisconsin Acad. Sci. 18: 531–565. 1916) but is confined almost exclusively to the plankton forms.—*Planktosphaeria* is proposed as a new genus in the family Palmellaceae, with *P. gelatinosa* as the only species.—The following new species are described: *Asterococcus limneticus, Oocystis eremosphaeria, Tetraedron verrucosum, Characium curvatum,* and *Chlorbotrys limneticus.*—New varieties are proposed, as follows: *Chroococcus limneticus* var. *elegans, Westella botryoides* var. *major, Oocystis natans* var. *major, Micractinium pusillum* var. *elegans, Actinastrum hantzschi* var. *elongatum, Scenedesmus arcuatus* var. *capitatus, Sorastrum americanum* var. *undulatum,* and *Botryococcus protruberans* var. *minor.*—The following new combinations appear: *Quadrigula pfitzeri* (*Ankistrodesmus pfitzeri Schröder*), *Kirchneriella obesa* var. *major* (*Kirchneriella major* Bernard).—Critical notes are given for *Phaeococcus planctonicus, Dactylococcopsis acicularis, Trichodesmium lacustre, Aphanizomenon flos-aquae, Gonium pectorale, Tetraedron proteiforme, Polyedriopsis spinulosa, Closteriopsis longissima* var. *tropica, Kirchneriella elongata, Actinastrum hantzschi, Crucigenia irregularis, C. lauterbornei, Sorastrum americanum, Characium limneticum, Closterium aciculare* var. *subpronum,* and *Botryococcus braunii.* The description of *Gloeocystopsis limneticus* is amended. Critical notes on the genera *Asterococcus* and *Pediastrum* are included. —*J. R. Schramm.*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

699. Andrews, A. LeRoy. **Bryological notes—V. Scapania nimbosa from Norway.** Torreya 19: 49–51. 1919.—This hepatic, previously known only from a few stations on the western coasts of the British Isles, was collected by the writer in 1907 in the Tverfjeldene (limestone) region of western Norway.—*J. C. Nelson.*

700. Claassen, Edo. **Mosses of several Ohio counties.** Ohio Jour. Sci. 19: 362–366. 1919.—A list is given of the moss flora of northern Ohio. It includes 5 Sphagnaceae, 72 Acrocarpi and 79 Pleurocarpi.—*H. D. Hooker, Jr.*

701. Dixon, H. N. **Miscellanea bryologica—VI.** Jour. Botany 57: 73–80. 1919.—*Chaetomitrium Deplanchei* (Hesch.) Duby and its allies are first considered, *C. Gehebii* Broth. and *C. tahitense* (Sull.) Mitt. being studied in detail, with critical notes on material from the New Hebrides, New Caledonia and other localities. The conclusions are reached that *C. Gehebii* is a synonym of *C. Deplanchei* and that *C. tahitense* should be considered merely a variety of the latter species, the new combination *C. Deplanchei* var. *tahitense* (Sull.) Dixon being made. Critical studies and notes are then given on the following species: *Gymnostomum oranicum* Rehm. of South Africa, which is definitely referred to the genus *Weisia* under the name *W. oranica* Rehm.; *Anoectangium scabrum* Broth. of German East Africa, which is made a synonym of *A. pusillum* Mitt.; *Taxithelium Gottscheanum* (Hampe) Broth. of the Philippine Islands; *Hypnum scabrellum* Lac. of the East Indies, which is made a synonym of *Sematophyllum lamprophyllum* Mitt.; *S. decipiens* Dixon, a new species from Borneo; *Bryum Beschereilei* Jaeg. of New Zealand, which is made a synonym of *B. erythrocarpoides* Hampe & C. M.; and *Barbella Lorieri* (Ren. & Card.) Fleisch. of eastern Asia. A few corrected determinations from an earlier paper on Ceylonese mosses are likewise included.—*K. M. Wiegand.*

702. Evans, Alexander W. **Hepaticae of St. Croix, St. Jan, St. Thomas and Tortola.** In: N. L. Britton. **The flora of the American Virgin Islands.** Mem. Brooklyn Bot. Gard. 1: 104–109. 1918.—After a short historical introduction 21 species from the islands in question are listed. These include 13 *Lejeuneae,* 3 *Frullaniae,* and 1 representative of each of the following genera: *Riccia, Plagiochila, Radula, Natothylas,* and *Anthoceros.* No new species or combinations are proposed. [See Bot. Absts. 1, Entry 1077.]—*A. W. Evans.*

703. EVANS, ALEXANDER W. **A taxonomic study of Dumortiera.** Bull. Torrey Bot. Club 46: 167–182. 1919.—A history of the genus *Dumortiera* is given with an account of the scope of the genus and its treatment by other workers. Many of the species are based on unsatisfactory characters; a discussion of the merit of the following is given: branching of the thallus, structure of the thallus, receptacles, and spores. Of the 10 species that have been referred to the genus, 3 belong to other genera; using the structural features of the thallus as a basis the writer recognises at present only 2 species, *D. hirsuta* (Sw.) Nees and *D. nepalensis* (Tayl.) Nees, both of which are widely distributed.—*P. A. Munz.*

704. HURST, C. P. **Ilfracombe mosses and hepatics.** Jour. Botany 57: 94–97, 119–124. 1919.—The report is based on collections made in 1917 around Ilfracombe and on Braunton Burrows, North Devonshire, England. Lists of mosses and hepatics, with notes and discussions, are given.—*K. M. Wiegand.*

MORPHOLOGY AND TAXONOMY OF FUNGI, BACTERIA AND MYXOMYCETES

E. W. OLIVE, *Editor*

705. ANDERSON, P. J. **Index to American species of Phyllosticta.** Mycologia 11: 66–79. 1919.—This index is designed to supplement "The North American Phyllostictas" by ELLIS AND EVERHART. Forty-one new species, 20 species reported for the first time, 116 new hosts, and transfers which have appeared since the publication of ELLIS AND EVERHART'S monograph are included. Citation of literature is given under each species and a host index presented which includes all species on which Phyllostictas have been reported. No attempt is made to trace synonomy.—*H. R. Rosen.*

706. ATANASOFF, D. **A novel method of ascospore discharge.** Mycologia 11: 125–128. *Fig. 1–3.* 1919.—In certain *Pyrenophora* species and in *Pleospora herbarum* (Pers.) Rab. which have asci whose walls are composed of two layers, the outer layer, during the process of spore liberation, ruptures and contracts at a point about one third of the distance up from the base of the ascus, thus forming a ring. The inner wall in turn ruptures immediately above the ring and the spores are set free at this point.—*H. R. Rosen.*

707. BEARDSLEE, H. C. **Michigan collections of Myxomycetes.** Rept. Michigan Acad. Sci. 19 (1917): 159–162. 1919. A list of Myxomycetes collected in Montmorency County, Michigan, during August of two summers. *Physarum diderma* Rost. and *P. leucopus* Link are reported as of special interest because of their rarity. Fifty-five species are reported.—*G. H. Coons.*

708. BENGSTON, IDA A. **The proteus group of organisms with special references to agglutination and fermentation reactions to classification.** Jour. Infect. Diseases 24: 428–481. 1919.

709. BESSEY, ERNST A. **An undescribed species of Ophiodothella on Ficus.** Mycologia 11: 55–57. *Pl. 5.* 1919.—*O. Fici* sp. nov. is described as producing a leaf spot on *Ficusaurea* in Florida. The fungus belongs near the genus *Ophiodothella* as limited by Theissen and Sydow, differing in the presence of paraphyses and in the possession of a pycinidial stage which is unlike any described for species of this genus.—*H. R. Rosen.*

710. DIETEL, P. **Über die wirtswechselnden Rostpilze.** [Concerning the heteroecious rusts.] Centralbl. Bakt. II, 48: 470–500. 1918.—The author has summarized, without bibliographical citations, the heteroecious rusts, so far as they were known up to the beginning of 1917, giving in convenient tabular form the rust, the aecidial and teleutosporic hosts. He thus enumerates 264 species of heteroecious rusts, as against Klebahn's 137. In another table, in parallel columns, certain heteroecious species are compared with parallel short-cycled micro- or lepto-forms, which occur on the same aecial host. The author concludes with a theoretical discussion of the origin of heteroecism.—*E. W. Olive.*

711. DONCASTER, L. **Note on an experiment dealing with mutation in bacteria.** Proc. Cambridge Phil. Soc. 19: 269. 1919.

712. ELLIOTT, JOHN A. **A smut on Iresine.** Mycologia 11: 87–88. *Fig. 1–4.* 1919.—*Tolyposporium iresine sp. nov.* is described as attacking the flowers of *Iresine paniculata* from Indiana.—*H. R. Rosen.*

713. FISCHER, E. **Neueres über die Rostkrankheiten der forstlich wichtigsten nadelhölzer der Schweiz.** [Recent information about important rusts of conifers of Switzerland.] Schweiz. Zeitschr. Forstw. 49: 113–120. 1918.—Review of recent European advances in knowledge, without bibliographical citations, of the following: *Cronartium asclepiadeum, Peridermium pini* and *Cronartium ribicola* on *Pinus; Melampsorella caryophyllacearum, Calyptospora goepperliana, Puccinastrum circaeae, Melampsora abieti-caprearum* on white fir (*Abies*); *Chrysomyxa rhododendri, C. ledi, Thecopsora sparsa, Aecidium strobilinum, Ae. conorum-piceae* on *Picea*; 4 species of *Melampsora* having aecia on *Larix* and telia on certain species of *Salix.*—*D. Reddick.*

714. FRASER, W. P. **Cultures of heteroecious rusts in 1918.** Mycologia 11: 129–133. 1919.—By using fresh aeciospores obtained from rusted plants of *Ranunculus Macounii* successful infections, with the production of uredinia and telia of *Uromyces Alopecuri* Seym., were obtained on *Alopecurus aristulatus* while *Agropyron tenerum* and *Hordeum jubatum* failed to show infection. Aecia of *Puccinia augustata* Peck were produced on *Mentha canadensis* by using telia from *Scirpus atrovirens.* Successful infections of *Puccinia Impatientis* (Schw.) Arth. were obtained on *Hordeum jubatum* by using aeciospores from *Impatiens biflora.* Uredinia and in most cases telia of *Puccinia Agropyri* E. and E. were produced on *Elymus canadensis, E. virginicus, Hordeum jubatum* and *Bromus ciliatus* by using aeciospores from *Thalictrum dasycarpum.* Urediniospores from *Bromus* failed to infect *Elymus virginicus, Agropyron Smithii, A. tenerum, A. repens* and *Hordeum jubatum* suggesting the possibility of two kinds or strains of aecia on *Thalictrum.*—*H. R. Rosen.*

715. G[AGER], C. S. **The Ames bequest.** Brooklyn Bot. Gard. Rec. 7: 23–24. Jan., 1918.—The fungus herbarium (517 specimens) and library of the late Frank H. Ames bequested to Brooklyn Botanic Garden.—*C. S. Gager.*

716. GÄUMAN, E. **Über die Spezialisation der Peronospora calotheca DeBary.** [Specialization of *P. calotheca.*] Svensk Bot. Tidsskr. 12: 433–445. *2 fig.* 1918.—See Bot. Abst. 3, Entry 765.

717. GÄUMAN, E. **Über die Spezialisation der Peronospora auf einigen Scrophulariaceen.** [Specialization of Peronospora on Scrophulariaceae.] Ann. Mycolog. 16: 189–199. *6 fig.* 1918.—See Bot. Abst. 3, Entry 766.

718. GÜSSOW, H. T. **The Canadian tuckahoe.** Mycologia 11: 104–110. *Pl. 7–9.* 1919.—Black sclerotia are found in Canada whose habitat is among the roots of poplar woods. They range from the size of a hen's egg to that of a cocoanut, bouncing like a solid rubber ball when fresh. The bark seems structureless and sand and stones are frequently found imbedded within the interior which is blackish olive-green mottled with dirty-white crevices. A sclerotium which was planted outdoors produced a fruiting body in 10 months. *Grifola Tuckahoe* sp. nov., a stiped polypore, is the name given to this body.—*H. R. Rosen.*

719. HAWK, PHILIP B., HAMILTON R. FISHBACK, AND OLAF BERGEIM. **Compressed yeast as food for the growing organism.** Amer. Jour. Physiol. 48: 211–220. 1919.—See Bot. Absts. 3, Entry 806.

720. HAWK, PHILIP B., CLARENCE A. SMITH, AND RALPH C. HOLDER. **Baker's yeast as food for man.** Amer. Jour. Physiol. 438: 199–210. 1919.—See Bot. Absts. 3, Entry 807.

724. HOHNEL, FRANZ V. **Fungi Imperfecti. Beitrage zur Kenntnis derselben.** [**Studies on imperfect fungi.**] Hedwigia 60: 129–176. 1918. [Continued from Hedwigia 59.] —The author gives the results of his examination of the following Fungi—usually with full descriptions:—(36) *Phoma occulta* Desm. = *Sclerophomella occulata* (Desm.) Hoehn.; *Sphaeria leptidea* Fr. the author does not accept the genus *Myxothyrium* Kabat & Buhak proposed for this fungus. He thinks that the ascogenous form is, as yet, unknown. (37) *Chaetopyrena hesperidum* Pass. Not *Chaetopyrena* Sacc. Syll. Fung. 2: 184. *Sclerochaeta* Hoehn. = *Chaetopyrena* Pass. For *Phoma penicillatum* Fckl. *Chaetopyrena penicillatum* (Fckl.) Hoehn. is proposed. It is probably a pycnidial state of *Pyrenophora*. (38) *Pyrenochaetina obtegens* Syd. A conidial state of *Parodiella*. (39) *Sphaeria miribelii* Fr. = *Sarcophoma miribelii* (Fr.) Hoehn. Gives synonymy. (40) *Phoma nitidum* Rob. = *Sclerophoma nitida* (Rob.) Hoehn. (41) *Sphaeria aliena* Fr. = *Sphaeria foveolaris* Fr. which is *Sclerophoma foveolaris* (Fr.) Hoehn. Gives synonymy. (42) *Phoma punctiformis* Desm. = *Sclerophoma punctiformis* (Desm.) Hoehn. (43) *Bakerophoma sacchari* Died, *insect* work. To bs stricken out. (44) Species of *Phyllosticta* on rose leaves. (1) *Phyllosticta rosae* Rob. An immature Pyrenomycetis. To be stricken out. (2) *Phyllosticta rosarum* Pass. Probably founded on spermogonia of *Phragmidium* and hence to be stricken out. (3) *Phyllosticta rosicola* Massal. Is a *Stictochorella* Hoehn. and probably connected with *Sphaerella rhodophila* Pass. (45) *Phoma exigua Desm.* To be stricken out. (46) *Hendersonia* (*Piestospora*) *smilacina* Desm. = *Cylindrophoma smilacina* (Desm.) Hoehn. (47) *Plenozythia euphorbiae* Syd. Is not a *Nectrioidacea* hut rather a *Macrophoma*. (48) *Sphaeria leguminis-cytisi* Desm. = *Diplodina leguminis-cytisi* (Desm.) Hoehn. The probable ascigerous stage, *Sphaerella leguminis-cytisi* Ces. & DeNot. becomes *Didymella leguminis-cytisi* Hochn. (49) *Botryella nitidula* Syd. Is a Darluca parasitic in the sori of a Puccinia. The parasitized rust is considered to be a new species for which the name *Puccinia aculeatispora* is proposed. No description is given of the spores of the rust of which hut few were seen. (50) *Sphaeria perforans* Rob. = *Tiarospora perforans* (Rob.) Hoehn. The synonymy is given. (51) *Haplosporella longipes* Ell. & Barth. Is probably a form of *Sphaeropsis mori* Berl. (52) *Pleosphaeropsis dalbergiae* Died. Appears to be referable to *Sphaeropsis* as also does the genus *Cytosphaera* Died. (53) *Apiosphaeriopsis pini-sylvestris* (Ferraris) Hoehn. This is *Coniothyrium olivaceum* Bon. var. *pini-sylvestris* Ferraris raised to specific rank. *Coniothyrium cedri* Rolland is probably identical. (54) The genus *Haplosporella* Speg. The type, *H. chlorostroma* Speg. is *Camarosporium robiniae* (West.) Sacc. from which *C. fenestratum* (B. & C.) Sacc. and *C. pseudoacaciae* Brun. are not specifically distinct. *H. brunaudiana* Pass. is overmature *Anthostomella scopariae* H. Fabre. In the type specimen *Eriospora biparasitica* Hoehn. n. sp. is parasitica. *Haplosporella caespitosa* (B. & Br.) Sacc. does not belong in this genus. It is probably a pycnidial form of *Cucurbitaria hederae* Wint. "*H. caespitosa*" in Roum. *F. gall exs.* 5778 is a form of *Coniothyrium hederae* (Desm.) Sacc. mislabeled. *H. dothidioides* Sacc. is over-mature *Phaeochora chamaeropsis* (Cke.) Hoehn. *H. minor* Ell. & Barth. = *Sclerothyrium minor* (E. & B.) Hoehn. *Haplosporella missouriensis* is probably a *Cytoplea*. *H. rhamni* Died. = *Sclerothyrium rhamni* (Died.) Hoehn. *H. dendritica* Raciborski is probably a *Lasmenia*. To *Haplosporella* have been referred very different and unrelated forms. For those with distinct conidiophores *Microsporella* n. gen. is proposed with *M. pityophila* Hoehn. as the type. It is perhaps a pycnidial state of *Cucurbitaria pityophila* (K. & S.) de Not. (55) *Stenocarpella zeae* Syd. Is probably a form of *Diplodia zeae* (Schw.) Lev. together with *Diplodia macrospora* Earle and *D. maydicola* Speg. (56) Species of *Septoria* on *Convolvulus*. *Septoria convolvuli* is a true *Septoria* of which *S. flagellaris* E. & E. and *S. fabletiana* Speg. are probably forms. *S. convolvuli* Desm. var. *soldanellae* Brun. is raised to specific rank with some doubt. *Septoria calystegiae* West. is referred to *Hendersonia* Berk. (non Sacc. = *Stagonospora* Sacc.) as *H. calystegiae* (West.) Hoehn. with *Polystigma pertusarioides* Desm. *Septoria sepium* Desm., *S. convolvulina* Speg. *A. obtusispora* Oud. and *S. longispora* Bondarzew as synonyms. (57) *Taeniophora acerina* Karst. *Phragmotrichum acerinum* Fr. Pycnidial state of (–) *Cucurbitaria acerina*. (58) The genus *Sphaeronemella* Karst. Proposes *Hyalopycnism.* gen. with *Sphaeria vitrea* Cda. as type. (59) *Mycorhynchella* n. gen. (*Nectrioideae*). 3 species including *Sphaeronema betae* Hollrung. (60) *Phoma acervalis* Sacc. Referred to *Cyanophomella* Hoehn.

n. gen. (61) *Botryogene visci* Syd. = *Stagonostroma visci* (Syd.) Hoehn. (62) Genus *Chaetostroma*. Species referred to *Amerosporium* Speg. (63) *Chaetodiscula hysteriformis* Buhak & Kabat. = *Myxormia typhae* (Fckl.) Hoehn. *Chaetodiscula* Buh. & Kab. = *Hymenopsis* Sacc. = *Godroniella* Karst. = *Myxormia* B. & Br. (64) *Pseudolachnea* Ranojevic = *Dinemasporiopsis* Bub. & Kab. which should be included in *Dinemasporium* Lev. More or less indistinctly septate conidia occur. (65) *Baetrezcipula strasseri* n. gen. & sp. on a fir needle. (66) *Psalidosperma mirabile* Syd. = *Ypsilonia cuspidata* Lev. (67) *Hainesia* Ell. & Sacc. Characters of the genus emended and species discussed. (68) *Phyllosticta destructiva* Desm. var. *a. malvarum* = *Ascochyta destructiva* (Desm.) Hoehn. var. b. *lycii* = *Ascochyta lycii* (Desm.) var. c *evonymi* = *Stictopatella* (n. gen.) *evonymi* (Desm.) Hoehn. var. d. *hederae* is a *Phyllosticta*. Perhaps *Ph. hedericola* D. & M. (69) *Apiosporium fumago* Fckl. In part = *Diplopeltis fumago* Hoehn. (70) *Peltaster Hedyotidis* Syd. A good form genus. (71) *Asteromella* Pass. & Thuem. emend. Hoehn. Pycnidia maculicolous, internal, small, with parenchymatous-membranaceous walls; conidia hyaline, small, bacillary; conidiophores short, simple (?); conidia apical, not catenulate; ostiole roundish. Segregated from *Phyllosticta* Pers. (72) *Sacidium alpestre* Ces. = *Leptothyrium alpestre* (Ces.) Hoehn. (73) Conidia of *Euryachora betulina* (Fr.) Schroet. *Didymochora* (n. gen.) *betulina* Hoehn. Leptostromaceae. (74) The genus *Dothiorella* Sacc. An aggregate genus in which have been placed species referable to *Pleurophomella* Hoehn., *Dothiorina* Hoehn., *Ceuthospora*, *Doihichiza* Lib. non Sacc. *Leptodothiorella* n. gen. etc. *Dothiorella* proper is defined and numerous species critically treated. *Aposphaerina episphaeria* n. gen. & sp. proposed. The section is not finished in this number. —*J. J. Davis.*

722. Kauffman, C. H. **Unreported Michigan fungi for 1915 and 1916, with an index to the hosts and substrata of Basidiomycetes.** Rept. Michigan Acad. Sci. 19 (1917): 145–157. 1919.—Continuing the listing of fungi in the Cryptogamic Herbarium of the University of Michigan, the writer lists the Phycomycetes, Ascomycetes and Basidiomycetes, and Fungi Imperfecti as yet unreported. In addition to the lists of fungi, the writer gives an index to the hosts and woody substrata of Hymenomycetes in Michigan.—*G. H. Coons.*

723. Kern, Frank D. **North American rusts on Cyperus and Eleocharis.** Mycologia 11: 134–147. 1919.—Five species of rusts are described on *Cyperus* including *Puccinia Cyperitagetiformis* (P. Henn.) comb. nov. and *P. abrepta* sp. nov. while 4 species are described on *Eleocharis* including *Puccinia liberta* sp. nov. and *Uredo incomposita* sp. nov. A key to the rusts on each host genus, based on urediniospore and teliospore characters, is presented.—*H. R. Rosen.*

724. Klebahn, H. **Perldermium pini (Willd.) Kleb. und seiner Uebertragung von Klefer zu Klefer.** [P. pini and its passage from pine to pine.] Flora 111–112: 194–207. *Pl. 4–5.* 1918.—See Bot. Absts. 3, Entry 774.

725. Kopeloff, Nicholas, and Lillian Kopeloff. **The deterioration of cane sugar by fungi.** Louisiana Agric. Exp. Sta. Bull. 166. *72 p., pl. 1–2, fig. 1.* 1919.—See. Bot. Absts. 3, Entry 819.

726. Kopeloff, Nicholas, and Lillian Kopeloff. **Some new phases of the problem of preventing sugar deterioration.** Louisiana Planter and Sugar Manuf. 62: 237–238. 1919. —See Bot. Absts. 3, Entry 820.

727. Levine, Michael. **Further notes on the sporadic appearance of non-edible mushrooms in cultivated mushroom beds.** Mycologia 11: 51–54. *Pl. 4.* 1919.—The author found an undetermined, white agaric, and *Alcuria vesiculosa* and *A. vesiculosa* var. *saccata* in mushroom beds.—*H. R. Rosen.*

728. Murrill, W. A. **Illustrations of fungi.** Mycologia 11: 101–103. *Pl. 6 (colored).* 1919.—The following polypores found around New York City are described and illustrated: *Ganoderma Tsugae* Murrill, *Inonotus dryophilus* (Berk.) Murrill, *Ganoderma sessile* Murrill and *Tyromyces Spraguei* (Berk. & Curt.) Murrill.—*H. R. Rosen.*

729. PALM, BJ. **Sur une Plasmodiophoracée nouvelle Liginera isoëtis.** [A new slime mold.] Svensk Bot. Tidsskr. 12: 228–232. *3 fig.* 1918.—Under the name *Liginera isoëtis*, Palm describes a new species of the genus *Liginera*. This newly discovered member of the Plasmodiophoraceae lives as a parasite within the cells of leaves of *Isoëtis lacustris*. Occasionally single spore walls were found in cells at some distance from the main centers of infection. The author thinks this distribution indicates infection by amoebae.—*L. O. Kunkel.*

730. TANAKA, TYÔZABURÔ. **New Japanese fungi. Notes and translations. VI.** Mycologia 11: 80–86. 1919.—The following fungi are described: *Uncinula curvispora* K. Hara sp. nov. (*U. septata* var. *curvispora* K. Hara var. nov.) on *Fagus sylvatica* var. *Siebaldi*, *U. geniculata Gerard* var. *carpinicola* K. Hara var. nov. on *Carpinus* sp., *U. necatar* (Schw.) Burr. var. *Actinidae* K. Hara comb. nov. on *Actinidia polygama* and *A. Kolomikta*, *Microsphaera alni* (Wallr.) Salm. forma *Quercus-glanduliferae* K. Hara forma nov. on *Quercus glandulifera*, *Macrophoma Corchari* Sawada sp. nov. on *Corchorus capsularis*, *Perenospora chenopodii-ficifolii* Sawada sp. nov. on *Chenopodium ficifolium*, *Bremia sonchi* K. Sawada sp. nov. on *Sonchus oleraceus*, *B. saussureae* Sawada sp. nov. on *Hemistepta carthamoides*, *B. ovata* Sawada sp. nov. on *Crepis joponica*, and *Helicobasidium mompa* N. Tanaka forma *macrosporum* K. Hara formi nov. on *Morus*.—*H. R. Rosen.*

731. TANAKA, TYÔZABURÔ. **New Japanese fungi. Notes and translations—VII.** Mycologia 11: 148–154. 1919.—The following fungi are described: *Didymella Mori* K. Hara sp. nov. on twigs of *Morus alba*, *Mycosphoerella Colocasiae* K. Hara sp. nov. causing a leaf spot of *Colocasia antiquorum*, *Valsa Moli* Miyabe et Yameda ex M. Miura causing a twig disease of apple, *Diaporthe Mali* Miura sp. nov. producing a leaf spot, fruit rot and twig blight of apple, *Phragmidium Rubi-Sieboldii* Kawagoe sp. nov. on leaves of *Rubus Sieboldii*, *Polyporus pubertatis* Yasuda sp. nov. on bark, *Neottiospora Theae* Sawada sp. nov. causing a leaf spot of *Theo sinensis*, and *Pestolozzia gossypii* Hori sp. nov. ex S. Thuruda which produces reddish-brown spots on cotton leaves.—*H. R. Rosen.*

732. WEIR, JAMES R. **Concerning the introduction into the United States of extra-limital wood-destroying fungi.** Mycologia 11: 58–65. 1919.—See Bot. Absts. 3, Entry 797.

PALEOBOTANY AND EVOLUTIONARY HISTORY

EDWARD W. BERRY, *Editor*

733. ARBER, AGNES. **Aquatic angiosperms: The significance of their systematic distribution.** Jour. Botany 57: 83–86. 1919.—Aquatic angiosperms are not primitive, but descendents of terrestrial ancestors. Their floral organs are decidedly terrestrial. A study of the sytematic distribution of aquatic families and species of Angiosperms shows certain general conclusions. Most obvious is the relative paucity of hydrophytes. Families of such are almost negligible. This is to the author not surprising, since the phanerogams are a terrestrial stock. Also, the area of freshwater is much smaller than the land surface. The occurrence of aquatic forms in many different families and genera, with no apparent rule, is noted. Many aquatic members in a family is held to show that the habit is ancient in that family, the differentiation of genera having occurred since the aquatic habit was adopted. The Nymphaeaceae and Podostemaceae are cited as examples. The primitive nature of the Helobieae is noted and the possible relation to the Ranales discussed. The aquatic habit here is ancient though the ancestors were terrestrial. The great diversity in this group is also nnted, as suggesting its primitive nature. It is suggested that the primitive Ranalean and Heliobian stock was particularly adapted to aquatic life. It is significant that no Sympetalous family has become entirely aquatic and no species has acquired submerged pollination. In the Compositae there are barely a one-half dozen aquatic members. The same is true of the early cohorts of the Engler system, which are now considered to be recent reduced forms. Aquatic habit in the dicots is largely confined to the Polypetalae, and mostly to the Rnnales. The Sympetalae may now

be handicapped in adopting an aquatic habit by the high degree of complexity they have acquired; while the more simple Ranales are perhaps more plastic to the aquatic habit. There was also less competition in earlier times than now, before the water was so well populated.—*K. M. Wiegand.*

734. Bertrand, Paul. **Sur la flore du bassin houiller de Lyon (bassin houiller du Bas-Dauphine).** [Flora of the Coal basin of Lyon.] Compt. Rend. Acad. Sci. Paris 168: 174–177. 1919.—To determine the possible extension of the St. Etienne Coal Basin in the direction of Lyon, deep borings have been made to the east and southeast of that city with the result that a series of bituminous and coal-bearing rocks to the thickness of 700 meters or more were discovered directly overlying the crystalline rocks. This series throughout has yielded determinable plant remains which serve well the purposes of correlation. *Walchia* occurs throughout the entire series, very sparingly at the base but abundantly toward the top, showing that the lowermost units are not older than the transition beds between the Rive-de-Gier and the St. Etienne series. The plant species, of which the author gives a list, are typical of the St. Etienne series and the absence even from the upper beds of the species characteristic of the zone of *Odontopteris minor* Br. shows that the uppermost units are no younger if indeed quite as young as the bituminous beds of Montrambert of the Lower Stephanien.—*H. Bassler.*

735. Garwood, Edmund J., and Edith Goodyear. **On the geology of the Old Radnor District with special reference to an algal development in the Woolhope Limestone.** Quart. Jour. Geol. Soc. London 74: 1–30. *Pl. I–VII.* 1918.—The Woolhope Limestone of the Old Radnor and Nash-Scar districts of the Welsh Border constitutes a special reef facies of the Wenlock series of the Middle Silurian with by far the most remarkable development of algal limestone yet recorded from the British rocks. This limestone, 80 to 100 feet thick, is unusually pure, $CaCO_3$ exceeding 99 per cent of the whole, calcareous algae, especially Solonopora, in places constituting fully half the rock. The algae occur in the form of irregular nodular growths varying in size from that of a pea to masses 17 centimeters in diameter, appearing on weathered surfaces as conspicuous white spots scattered through the deposit. Two species of algae are discussed in detail and figures on Plate VI. *Spharocodium gothlandicum* Rothpletz and *Solonopora gracilis* sp. nov. (described on page 27). These fossil reefs though strikingly similar, appear to be slightly older than the algal-reef-bearing series of southern Gotland.—*H. Bassler.*

736. Nathorst, A. G. **Ginkgo adiantoides (Unger) Heer in Tertiär Spitzbergens nebst einer Kurzen Uebersicht der übrigen fossilen Ginkgophyten desselben Landes.** [G. adiantoides in Spitzbergen Tertiary, etc.] Geol. Fören. Förhandl. Stockholm 41: 234–248. *Fig. 1–4.* 1919.—The discovery of this species near the base of the Tertiary, both at Green Harbor and Braganza Bay, Spitzbergen, here announced for the first time, is interesting from the fact that these localities are 8° of latitude farther north than any at which it has been discovered heretofore, though its distribution in the North Temperate Zone is wide. In time it is known to range from the Upper Cretaceous to the Upper Pliocene. In a statement to the brief review of other ginkgoalian plants of Spitzbergen, the author emphasizes that the following must be considered merely preliminary to a critical revision of this group which he hopes to publish as a supplement to his Contributions to the Mesozoic Flora of Spitzbergen. The so-called "Taxodium Shales" (Tertiary) of Kap Staratschin yielded two species of *Torellia Feildenia*] somewhat provisionally assigned to the Ginkgoales. In the "Sandstone Series," [apparently transitional between the Cretaceous and the Jurassic of this region, there are two plant bearing horizons about 40 meters apart, of which the higher comprises the so-called "Ginkgo beds" and the lower the "Elatides beds." The first-mentioned are the richer in ginkgoalian remains, having already yielded several species each of genera the *Ginkgo* and *Boiera* and at least one each of the genera *Czekonowskia, Phoenicopsis,* and *Eretmophyllum* (?). Two much reduced species of *Baiera* and one of *Torellio* are the only ginkgoalians thus far reported from the Elatides beds. Neither the Rhaetic nor the Triassic of Spitzbergen have yet yielded plants of this group but *Psygmophyllum Williomsoni* Nath. from the Devonian has some superficial characters which suggest affinity. [See Bot. Absts. 3, Entry 1613.]—*H. Bassler.*

PATHOLOGY

DONALD REDDICK, *Editor*

737. ANDERSON, P. J. **Index to American species of Phyllosticta.** Mycologia 11: 66–79. 1919.—See Bot. Abstr. 3, Entry 705.

738. ANONYMOUS [B. O. DODGE]. **Index to American mycological literature.** Mycologia 11: 97–100. 1919.

739. ANONYMOUS [B. O. DODGE]. **Index to American mycological literature.** Mycologia 11: 158–161. 1919.

740. ANONYMOUS. **Hearing on proposed restrictions on importation of plants.** Brooklyn Bot. Gard. Rec. 7: 93–95. July, 1918.—Refers to public hearing held at Washington, May 28, 1918, on plant quarantine legislation of United States Congress.—*C. S. Gager.*

741. BENNETT, C. W. **Soft rot of pepper caused by Bacillus carotovorus.** Rept. Michigan Acad. Sci. 20: 351–352. *Pl. 28.* 1918.—A description of a soft rot disease observed in 1917 on pepper plants growing in the Horticultural plots of the Michigan Agricultural College. Experiments were made in order to compare the pepper rot organism with *Bacillus carotovorus*, which had been suggested as the causal organism. There was no apparent difference between the rot symptoms produced by the pepper rot organism and those produced by laboratory culture of *Bacillus carotovorus*. As a result of these experiments the writer concludes that the pepper may be listed among the many hosts of *Bacillus carotovorus*.—*J. Norma Anderson.*

742. BEARY, JAMES B., AND JOHN K. GILES. **The production of corn. Corn Club Guide. Part I. Increased yields as a result of disease control.** Georgia State Coll. Agric. Bull. 165. *16 p., 13 fig.* 1919.—See Bot. Abstr. 3, Entry 481.

743. BERAY, JAMES B. **Georgia plant diseases. A brief discussion of the diseases of economic crops and recommendations for prevention and control.** Georgia State Coll. Agric. Bull. 168. *57 p.* 1919.

744. BESSEY, ERNST A. **An undescribed species of Ophiodothella on Ficus.** Mycologia 11: 55–57. *Pl. 5.* 1919.—See Bot. Abstr. 3, Entry 709.

745. BRANDES, ELMER W. **Distribution of Fusarium cubense E. F. S., the cause of banana wilt.** Rept. Michigan Acad. Sci. 20: 271–275. 1918.—The author gives a report of observations in American banana countries north of the equator. He concludes that the banana wilt organism, *Fusarium cubense*, which he has already shown to be pathogenic (Ann. Porto Rico Agric. Exp. Sta. 1916: 29–31), exhibits biologic specialization in the several countries visited thus accounting for the observed relative susceptibility of a given variety grown in different countries. Observations are reported also on the relation of climatic conditions to the prevalence of the disease in various countries. Sustained wet weather favors the parasite while dry weather is unfavorable.—*L. R. Hesler.*

746. BRITTLEBANK, C. C. **Tomato diseases.** Jour. Dept. Agric. Victoria 17: 231–235. 1919.—A new tomato disease, "spotted wilt," first found in 1915–16, has proved disastrous in 1918 19 in Victoria. The attack is first on the new terminal leaves. Brown and blackened areas scattered between the larger veins appear. The author states that it is the same disease that occurs in America (Phytopathology 6: 162. 1919). Examination failed to disclose a causal organism, and inoculation experiments gave negative results. Experiments on sterilized soil suggest that the disease might be due to some chemical or physical deficiency in the soil.—*J. J. Skinner.*

747. Brittlebank, Charles. Green manurial crops and "take all." Jour. Dept. Agric. Victoria 17: 171–173. 1919.—See Bot. Absts. 3, Entry 848.

748. Chase, W. W. Common insects and diseases of the apple. Georgia State Bd. Entomol. Bull. 54. *51 p., 12 pl., 22 fig.* 1919.—Contains descriptions, life histories and methods of controlling the more common pests of the apple, *Pyrus malus*. The last part devoted to cultural directions.—*T. H. McHatton.*

749. Colón, E. D. La eradicatión de la enfermedad de las rayas amarillas de la caña. [Eradication of yellow-stripe disease of cane in Puerto Rico.] Estac. Exp. Insul. Puerto Rico Circ. 14. *6 p., 3 pl.* 1918.—A study of literature and specimens of mottled cane of Porto Rico has revealed that it is the same disease already known and studied in Java and Hawaii under the name of the "yellow stripe" disease. A summary of the facts known of the disease seems to indicate that it is a characteristic mosaic disease. [English translation in Agric. News Barbados 18: 62–63. 1919.]—*F. M. Blodgett.*

750. Coons, G. H. The soft rot of hyacinth. Rept. Michigan Acad. Sci. 20: 353–354. *Pl. 39–40.* 1918.—A rot of the hyacinth caused by *Bacillus carotovorus* is recorded. The disease is considered identical with a rot described by Heinz in 1889 and attributed to *Bacillus hyacinthi septicus.*—*L. M. Massey.*

751 Coons, G. H. Michigan plant disease survey for 1917. Rept. Michigan Acad. Sci. 20: 425–450. *Pl. 41–50.* 1918.—A summary of plant disease conditions in State of Michigan for 1917 based upon general observations and special reports. Specimens sent in by farmers and county agents furnished data for conclusions drawn. Reports were made on diseases of cereals, orchard and small fruits, vegetables, and conifers. The article shows the widespread distribution of these diseases and stresses the fact that they are easily communicable. It is the purpose of the Plant Disease Survey to stop the great leak in agriculture which results from preventable diseases, and in this capacity it deserves recognition by both state and nation.—*J. Norma Anderson.*

752. de Castella F. Copper fungicides for vine diseases. Jour. Dept. Agric. Victoria 17: 104–112. 1919.—It is shown that copper-soda sprays are most efficient when the copper is mainly in the form of basic sulphate, the advantages being greater stability, less scalding of foliage, and higher fungicidal power. When pure sodium carbonate is used the copper will be contained in the carbonate form. The class of mixture which causes the least damage is that which contains the maximum of tetracupric sulphate. Either an acid or alkaline copper soda causes foliage damage.—In the case of an alkaline spray, leaf injury is due not to excess soda, but to the presence of copper carbonate. Directions for mixing: dissolve 10 pounds of bluestone in 20 gallons of water and 3.5 pounds of soda ash in 30 gallons of water. Mix the 2 solutions and screen.—*J. J. Skinner.*

753. Dungan, George H., and John Pieper. Control of important potato diseases and insect pests. Illinois Agric. Exp. Sta. Ext. Circ. 31. *7 p.* 1919.—Treatments for the control of some of the potato diseases are given.—*M. J. Prucha.*

754. Earle, F. S. Instrucciones para la eradicación de la enfermedad del mosaico de la caña. [Instructions for eradicating mosaic disease of cane. Puerto Rico Estac. Exp. Insul. Circ. 14. *P. 6–8.* 1918.—The key to control, as the disease is not curable, consists in planting only healthy cuttings, either from healthy fields or resistant varieties. Care should be taken that new plantings be isolated from old. New planting should be inspected and diseased plants removed. [English translation in Agric. News Barbados 18: 62–63. 1919.]—*F. M. Blodgett.*

755. Edgerton, C. W. The mottling disease or mosaic of sugar cane. Louisiana Planter and Sugar Manufacturer 62: 397. 1919.—A disease of sugar cane which resembles the mottling disease of Porto Rico and probably is identical with it is present in some parts of Louisiana.

The loss caused to the sugar industry is evidently not as great as in Porto Rico though no reliable information is as yet available on this point. The presence of this disease possibly explains the deterioration in some varieties of cane which has been noticed during the past few years. The Japanese canes are immune to the disease.—*C. W. Edgerton.*

756. ELLIOTT, JOHN A. A smut on Iresine. Mycologia 11: 87–88. *Fig. 1–4.* 1919.—See Bot. Abstr. 3, Entry 712.

757. ERWIN, A. T. Tip burn. Potato Mag, 1°: 8, 34. *2 fig.* 1919.—Popular account of a potato disease, regarding cause, appearance, control and varietal susceptibility.—*Donald Folsom.*

758. FARRELL, J. Apple culture in Victoria. Jour. Dept. Agric. Victoria 17: 145–157. *Pl. 6.* 1919.—A continuation of an article treating of apple diseases. For eradication of San José scale hydrocyanic acid gas is stated to be the most effective and reliable agent. A description of several fungus diseases is given and control measures are described.—*J. J. Skinner.*

759. FEDERAL HORTICULTUAL BOARD. U. S. DEPARTMENT OF AGRICULTURE. Quarantine on account of black stem rust. Service and Regulatory Announcements 62. *P. 58–59.* 1919.—On and after May 1, 1919, no species or cultivated varieties of *Berberis* or species of *Mahonia* may be shipped into the following states: Nebraska, Iowa, Illinois, Indiana, Ohio, North Dakota, South Dakota, Minnesota, Montana, Wisconsin, Michigan, Wyoming, and Colorado. These species have been largely eradicated from the states named. The purpose is to prevent the spread of black stem rust of cereals caused by *Puccinia graminis.*—*D. Reddick.*

760. FELT, E. P. Insect galls and gall insects. Ottawa Nat. 32: 127–131. *16 fig.* 1919.

761. FISCHER, E. Neueres über die Rostkrankheiten der forstlich wichtigsten nadelhölzer der Schweiz. [Recent information about important rusts of conifers of Switzerland.] Schweiz. Zeitschr. Forstw. 49: 113–120. 1918.—See Bot. Abstr. 3, Entry 713.

762. FISCHER, EDUARD. Die Publikationen über die Biologie der Uredineen im Jahre 1917. [Publications on the biology of rusts in 1917.] Zeitschr. Bot. 10: 389–395. 1918.

763. GAINES, E. F. Comparative smut resistance of Washington wheats. Jour. Amer. Soc. Agron. 10: 218–222. 1918.—Stinking smut [*T. laevis*] is more abundant in the winter-wheat section of Washington than anywhere else in U. S. A. It is not uncommon to find fields with 40 per cent smut.—Seed of 13 varieties was inoculated heavily with spores and planted in test rows. Turkey is the only highly resistant wheat of commercial importance in the list. —It seems probable from the outcome of the tests that two distinct factors function in resistance. One prevents infection, the other prevents smut-ball formation. If they do exist there is a high degree of correlation between them.—*D. Reddick.*

764. GARDNER, MAX WILLIAM. The mode of dissemination of fungous and bacterial diseases of plants. Rept. Michigan Acad. Sci. 20: 357–423. 1918.—This phase of plant pathology is important, as attested by the extensive literature on the subject and by recent governmental activities along the lines of quarantine. Not only the agents of dissemination, but also adaptations of disease-producing organisms to these agents, are discussed. The text is first presented in topical outline form and the literature is then reviewed following the scheme presented in the outline. The natural agencies, most important in local spread, are air and wind, water, insect and other animals. Man in commercial and other practices is responsible for the dissemination of pathogenic bacteria and fungi over long distances. The list of references to literature contains 220 titles.—*L. R. Hesler.*

765. Gäumann, E. **Über die Spezialisation der Peronospora calotheca DeBary. [Specialization of P. calotheca.]** Svensk Bot. Tidskr. 12: 433–445. *8 fig.* 1918.—Using *Peronospora calotheca* from various plants, the author made infection experiments and measured a large number of conidia. The conclusion is reached that the Peronosporae on different species of the Rubiaceae are not only biologically but also morphologically different.—Instead of using the specific name *Peronospora calotheca* for all forms on Rubiaceae, different specific names should be applied to the forms on different hosts. Four new species of *Peronospora* are described.—*J. Rosenbaum.*

766. Gäumann, E. **Über die Spezialisation der Peronospora auf einigen Scrophulariaceen. [Specialization of Peronospora on Scrophulariaceae.]** Ann. Mycolog. 16: 189–199. *6 fig.* 1918.—As a result of infection experiments, the author concludes that in the case of *Peronospora* found on plants belonging to the Scrophulariaceae possibly a greater biologic specialization is found than in many Uredineae. Study of the conidiophores and conidial measurements show that the majority of these biologically specialized forms can also be distinguished morphologically.—In some cases two different morphological species occur on the same host. Peronospora on *Linaria vulgaris* is mentioned as an example. In this case one form occurs on the reproductive and the other on the vegetative parts.—Seven new species of *Peronospora* are described.—*J. Rosenbaum.*

767. Gentner, G. **Über durch Macrosporium sarciniforme Cav. hervorgerufene Erkrankungen der Luzerne und des Klees. [Diseases of alfalfa and clover caused by M. sarciniforme.]** Prakt. Blätt. Pflanzenb. u. Pflanzensch. 16: 97–105. 1918.—See Bot. Absts. 3, Entry 2651.

768. Gough, G. C. **Wart disease.** Gard. Chron. III, 63: 206. *Fig. 90.* 1918.—Review of recent literature on potato wart "caused by *Synchitrium endobioticum*."—*D. Reddick.*

769. Graves, Arthur Harmount. **Some diseases of trees in greater New York.** Mycologia 11: 111–124. *Pl. 10.* 1919.—A bark disease of the butternut is described in which limbs and whole trees are killed; *Melanconium oblongum* is associated with the disease. The most destructive disease of sweet birch, the symptoms of which are typical lipped cankers, is due to *Cremectria coccinea* (Pers) Seaver (Nectria coccinea Fr.). Winter injury or leaf scorch of the beech, heart rots of oaks caused by 3 fungi (*Globifomes graveolens* (Schw) Murr., *Inonotus hirsutus* (Scop.) Murr., and Pyropolyporus everhartii (Ellis & Gall.) Murr.), a bark disease of the paper mulberry caused by Creonectria purpurea (L.) Seaver (Nectria cinnabarina Fr.), injury to various trees from severe winter conditions of 1917–18, are among other diseases discussed.—*H. R. Rosen.*

770. Hill, Gerald F. **History of citrus canker in the Northern Territory.** Bull. Northern Territory, Australia 18. *8 p., 8 pl.* 1918.—An account of the discovery of citrus canker and the results of a subsequent careful examination of practically all known citrus trees in the Northern Territory of Australia, to which Territory the disease is confined. The disease has been found at Stapleton, Fort Darwin, Darwin Botanic Gardens, Darwin Post Office, Point Charles Lighthouse, Cape Dow, and at the Aboriginal Reserve at Oenpelli. The discovery at Stapleton was made in December, 1912. *Pseudomonas citri* was isolated and identified. In the sections of the territory where the disease is found, infection is severe.—Spraying with Bordeaux mixture (4:4:50) and with copper soda sprays was ineffectual. All citrus trees in the infected areas have been burned and growing or importation for a period of five years prohibited. Government proclamation in 1915 prohibited importation of citrus trees from any part of the world. Later modification allows importation from California and Arizona, U. S. A.—Most of the trees in the infested regions came from the Botanic Gardens, Darwin. There is good evidence to show that the disease was introduced into Darwin Botanic Gardens from China and Japan.—*J. P. Benson.*

771. Hiltner, L. **Über Anquellung, Beizung und Impfung des Saatguts. [Soaking, disinfecting and inoculating seed.]** Prakt. Blätt. Pflanzenb. u. Pflanzensch. 16: 105–111. 1918.

772. JOHNSON, JAMES, AND R. E. HARTMAN. **Influence of soil temperature on the root-rot of tobacco.** Jour. Agric. Res. 17: 41–86. *Pl. 1–8.* 1919.—Authors' summary is as follows: "(1) The root-rot of tobacco, caused by *Thielavia basicola*, is marked by the stunting of plants in various degrees due to a reduced root system. The extent of the damage is determined in a large measure by the environmental conditions surrounding the roots of the host.—(2) A study of these environmental conditions is essential to the proper understanding of the occurrence and distribution of the disease in general and local areas, and to good judgment in recommendation for control measures.—(3) There seems to be no variation in the pathogenicity of the root-rot fungus secured from different sources. The amount of disease is determined entirely by the susceptibility of the host, the amount of infestation, and the soil environmental factors surrounding the roots of the host. (4) The factors especially studied were the amount of infestation in the soil, the soil moisture, soil temperature, soil reaction, physical structure, and fertility. An analysis of these factors separately as related to root-rot frequently is very difficult, if not impossible. Under normal conditions the end result in injury by root-rot is the sum total of the favorable and unfavorable action of these factors on the disease. Some of these factors are much more important than others.—(5) Other factors aside, the extent of infection and injury from tobacco root-rot is directly proportional to the amount of infestation of the soil.—(6) Root-rot is seemingly capable of developing in relatively dry soils. Increasing the moisture content of the soil up to three-fourths of its water-holding capacity does not materially increase root-rot. Saturated soils are, however, considerably more favorable for the disease than unsaturated ones.—(7) The temperature of the soil is undoubtedly the most important factor determining the extent of the root-rot of tobacco, other factors being equal. The most favorable temperature for the disease ranges from 17° to 23°C. Below 15° the disease is less marked, and above 26° the severity is gradually reduced until at about 29° or 30° it has little or no influence. At 32° practically no infection occurs even in the most heavily infested soils. Soil temperature records in the field for four seasons indicate that occurrence of the disease under practical conditions is determined primarily by soil temperature.—(8) The disease is checked by very high soil acidity. Heavy infection can occur, however, in soils showing a considerable acid reaction. The results depend a great deal upon the susceptibility of the variety used in the test, the amount of infection, the soil temperature, and on other factors. The results of tests of Wisconsin tobacco soils indicate that the use of acid fertilizers will not reduce infection by *T. basicola*. Although alkaline soils are more favorable to disease than very acid ones, the use of lime on infested soils may not necessarily reduce the yield due to increased infection from *T. basicola*.—(9) The amount of organic matter present or introduced into the soil does not play a very important part in the amount of infection. High organic matter content, however, no doubt favors increased infestation and aids the fungus to persist in the soil. Where heavy inoculation is made, infection apparently occurs more readily in pure sand than in the presence of organic matter, but under conditions unfavorable for the parasite the amount of infestation is more rapidly reduced in soils lacking in organic matter.—(10) Clay soils as such seemingly are no more favorable for infection than sand, and under certain conditions possibly less so. Clay may, however, favor the persistence of the parasite in the soil, and may actually favor infection because of increased danger of saturation with water and because of the occurrence of lower temperatures than in sandy soils.—(11) Increasing the fertility of infested soil by pure chemicals is likely to cause increased stunting of growth rather than increased growth, especially if too high a concentration of soil solution results. Fertilizers applied to heavily infested soils under practical conditions seem to be largely wasted except in seasons in which such high temperatures result that the disease is held in check.—(12) Field observations and limited laboratory experiments seem to show that infested soils when compacted are more favorable for the disease than loose, open soil.—(13) Transplanting infected seedlings to an uninfested field is bad practice, although recovery from the disease may occur. Such recovery, environmental conditions aside, is proportional to the resistance of the type used."—Extensive experimental data are presented in detail in support of the conclusions. A bibliography of 27 titles is appended.—*D. Reddick.*

773. JOHNSON, JAMES. **The influence of heated soils on seed germination and plant growth.** Soil Science 7: 10–103. *Pl. 1–3.*—See Bot. Absts. 3, Entry 854.

774. Klebahn, H. **Peridermium pini (Willd.) Kleb. und seiner Uebertragung von Kiefer zu Kiefer.** {P. pini and its passage from pine to pine.} Flora 111-112: 194–207. *Pl. 4–5.* 1918.—After a discussion of the validity of the species and the exhaustive but fruitless search for an alternate host Haack's experiments on direct inoculation with aeciospores are discussed. The author then outlines the problem, his own inoculation experiments, and their results. Thirty per cent of the 2- to 4-year old trees of *Pinus sylvestris* which were dusted with aeciospores of *Peridermium pini* developed infection; some showing the presence of mycelium, some bearing pycnia, and some bearing fully formed aecia within two years of the time of inoculation. The experiments were carefully controlled and they are therefore considered conclusive enough to establish the fact that *Peridermium pini* can spread directly from pine to pine by means of aeciospores. The author discusses the general question of susceptibility and the bearing of the results obtained on problems connected with the investigation of heteroecious rusts.—*Reginald H. Colley.*

775. Knakover, L. J. **The leaf-spot of red clover caused by Macrosporium sarcinaeforme Cav.** Rept. Michigan Acad. Sci. 19 (1917): 273–328. *5 pl., 2 fig.* 1918.—The writer reports investigation on red clover leaf spot caused by *Macrosporium sarcinaeforme* which attacks leaves and petioles of red clover but not alsike or other legumes. The writer describes fully the signs of the disease and the morphology of the causal organism. Inoculation experiments indicate that 5 to 7 days are necessary for spot formation. The injury caused by the fungus brings about the disintegration and collapse of the cells of the host, the fungus advancing intercellularly and intracellularly. The organism grows readily in media and its appearance on different substrata is described. Relations to temperature, humidity, light and dark are given. Attenuation was found in old cultures and this attenuation seems correlated with loss in power to produce substance toxic to the clover leaf. Wind of approximately 4 miles an hour velocity carried the spores 14.6 miles. Bibliography of 23 titles is appended.—*G. H. Coons.*

776. Lewis, A. C., W. W. Chase, and W. F. Turner. Spray calender. Georgia State Bd. Entomol. Bull. 53. *30 p., 2 pl., 8 fig.* 1919.

777. Lewis, A. C., and C. A. McLendon. **Cotton variety tests 1918.** Georgia State Bd. Entomol. Bull. 52. *40 p., 1 fig.* 1919.—See Bot. Absts. 3, Entry 473.

778. Lutman, B. F. **Osmotic pressures in the potato plant at various stages of growth.** Amer. Jour. Bot. 6: 181–202. *1 table, 2 fig.* 1919.—See Bot. Absts. 3, Entry 800.

779. Makemson, Walter Kenneth. **The leaf mold of tomatoes caused by Cladosporium fulvum Cke.** Rept. Michigan Acad. Sci. 20: 309–350. *Pl. 23–37.* 1918.—Tomato leaf mold (*Cladosporium fulvum* Cke.), appearing as velvety, tawny-olive colored patches on the under side of the leaf and as yellow spots produced in the tissue above, occurs in southern climates as a serious disease of field grown plants and of plants grown under glass in northern latitudes. Fruits once set escape the disease, and main stems of the vines are not often attacked. Blossoms are especially susceptible. Successful inoculation experiments are reported. Infection is stomatal. The mycelium is both inter- and intra-cellular. Minimum temperature for growth of fungus is 9°C., the optimum 20° to 25°C., and the maximum below 34°C. Moisture favors growth. Strong, diffuse light retards spore formation. The fungus grows best on a reaction of medium varying from +10° to +15° Fuller's scale, but withstands a considerable range in reaction. Translocation of starch in infected plant leaves is interfered with. Organism is disseminated by air currents. Period of incubation is usually from 6 to 10 days, but may be longer depending on conditions of humidity and temperature. Growth as a saprophyte may enable the fungus to exist between crops, but the longevity of the conidia probably accounts for its survival. Bordeaux mixture proved inefficient in the control of the disease; ammoniacal copper carbonate, sulfide of potassium and sulfur dust also valueless. Self-boiled lime-sulfur and concentrated lime-sulfur solution gave evidence of value, the former giving results more promising in moist chamber experiments but less effective under natural conditions than the latter. Sulfur fumigation, ventilation control and clean culture are recommended as prophylactic measures.—*L. M. Massey.*

780. McHATTON, T. H., AND J. W. FIROR. **Spray calender for Georgia.** Georgia State Coll. Agric. Bull. 170. *12 p., 5 fig.* 1919.

781. OSBORN, T. G. B. **Report of the Consulting Botanist and Plant Pathologist.** Rept. Min. Agric. South Australia 1917–18:——. 1918. [Issued separately, *5 p.*]—"Take-all" (*Ophiobolus graminis*) on oats is reported, but the disease is not so severe as on wheat and barley.—A species of *Alternaria* was apparently responsible for barren wheat plants.—Leaf stripe, *Helminthosporium inconspicuum*, on *Zea mays* is reported for the first time.—The following potato diseases were found: early blight (*Alternaria solani*), wilt (*Fusarium solani*), Irish blight (*P. infestans*), scab (*Rhizoctonia solani*); the latter disease is responsible for reduction in yield and a depreciation of the crop.—A dieback of apricots is attributed to senility.—*Coniothecium chromatosporium* is constantly associated with a canker of apple and pear.—*Venturia pomi*, of apples and pears, causes blossom rot of certain sheltered apple trees.—A bacterial disease of *Citrus* is being studied.—The following diseases have been found: onion mildew (*P. schleideniana*), cucurbit mildew (*Erysiphe cichoracearum*), streak of sweet pea (*Bacillus lathyri*), anthracnose of *Platanus* (*Gloeosporium nervisequum*), also found injuring American oaks (*Quercus* sp.), rhododendron leaf disease (*Gloeosporium rhododendri*), poplar leaf blister (*Taphrina aurea*), smut of couch grass (*Cynodon dactylon*) caused by *Ustilago cynodontis*.—*D. Reddick.*

782. PALM, B. J. **Sur une Plasmodiophoracée nouvelle, Liginera isoetis.** [A new slime-mold.] Svensk Bot. Tidskrift 12: 228–232. *3 fig.* 1918.—See Bot. Abstr. 3, Entry 729.

783. PARROTT, P. J., H. E. HOOGKISS, AND F. Z. HARTZELL. **The rosy aphis in relation to abnormal apple structures.** New York Agric. Exp. Sta. [Geneva] Tech. Bull. 66. *29 p., 8 pl. (3 colored), 6 fig.* 1919.—Apples attacked by rosy aphis (*Aphis sorbi* Kalt.) are abnormally small, poorly colored and unsymmetrical. They contain fewer seeds than normal apples, the seeds are of smaller average size, and more of them are imperfect. Also, the seeds are more variable in number and weight. Although attacks by rosy aphis increase the number of small, few-seeded and seedless fruits, the number of such fruits which fall prematurely is fewer than under normal conditions. Different structures of the apple are affected in different degrees, the weight of the fruit being most affected, weight of seeds next, and number of seeds least. Both in aphis-injured apples and normal apples the relation between fruit weight and seed weight appears to be closer in small fruits than in large ones; but this relation is not very marked in any case. While there is no reduction in the number of primary fibro-vascular bundles, even in severely malformed fruits, their development is arrested on the side of greatest distortion, and the number of ultimate branches is much fewer than in normal fruits.—*F. C. Stewart.*

784. POLLOCK, J. B. **The longevity in the soil of the Sclerotinia causing brown rot of stone fruits.** Rept. Michigan Acad. Sci. 20: 279–280. 1918.—Evidence is set forth to show that the sclerotia of the *Sclerotinia* causing plum brown rot may remain alive in fallen mummied fruits for 10 years at least, and some of them produce apothecia every year. It is suggested that this longevity of the fungus renders control by disposal of mummied fruits more difficult.—*L. R. Hesler.*

785. REED, GEORGE M. **Phytopathological survey of the trees and shrubs of Prospect Park and the Botanic Garden (Brooklyn). II. Report of the second season's work.** Brooklyn Bot. Gard. Rec. 7: 14–23. Jan., 1918.—Continuation of: Same title. I. Report of the first season's work (*Ibid.* 6: 14–20. Jan., 1917).—The area intensively surveyed contained approximately 1830 trees, representing about 50 different kinds. 231 trees had decayed areas classified as major, and 192 trees had decayed areas classified as minor. Thus 423 trees, or a total of 23 per cent were found to be injured by decay producing fungi. Certain kinds of trees, as the silver maple, Norway maple, the ashes, and the birches, showed a very high percentage (25 to 50 per cent) of decayed areas. Other species showed lower percentages of injury.—*C. S. Gager.*

786. Sharples, A. **The laticiferous system of Hevea brasiliensis and its protective function.** Ann. Bot. 32: 247–251. 1918.—See Bot. Absts. 1, Entry 1409.

787. Shimbo, Ippo. **Beiträge zur Kenntniss einiger einheimischen Pflanzengallen in Japan.** [A Japanese plant gall.] Bot. Mag. Tokyo 33: 1–12. *3 fig.* 1919.

788. Stakman, E. C. **Destroy the common barberry.** U. S. Dept. Agric. Farmers' Bull. 1058. *11 p., 6 fig.* 1919.

789. Stakman, E. C. **Banish the barberry and save the wheat.** Amer. Assoc. Nurserymen Ann. Conv. 43: 41–46. 1918.

790. Stevens, Frank Lincoln. **An apple canker due to Cytospora.** Illinois Agric. Exp. Sta. Bull. 217: 367–379. *1 pl., 15 fig.* 1919.—The disease was found on the main trunk of a young apple tree, the diseased area, 22 cm. wide, encircling the tree trunk. The fungus appeared as small black pustules under, or erumpent through the cutiele. Under the microscope these proved to be compound pycnidia. No ascigerous structures were found. The method of isolation is described. Artificial inoculations in test tubes of apple and other twigs with the pure culture proved successful. Though the fungus here discussed agrees well with *Cytospora* of *Valsa leucostoma*, it is best to defer final judgment as to its specific name.—*M. J. Prucha.*

791. Stevens, F. L., and Esther Y. True. **Black spot of onion sets.** Illinois Agric. Exp. Sta. Bull. 220: 507–532. *Fig.* 1–19. 1919.—The disease causes serious losses, appearing on onions during storage, particularly on onion sets of white varieties. Several fungi were found present on the diseased specimens, the so-called *Vermicularia* being present in 60 to 80 per cent of onion sets examined.—The disease has been found in many states. It assumes three distinctly different types. The most common type appears as a nearly black spot, about 1 cm. in diameter, on the dry outer scales of the bulb. In this spot numerous black knots of mycelium are seen. They are typical sporodochia and the new combination *Volutella circinans* is proposed. The mycelium is 3.6 to 10.8 μ in diameter, irregularly branched and cut by septa at irregular intervals. Perithecia were found in organic connection with mycelium recognisable as that of the fungus causing the disease. A new genus, *Cleistothecopsis*, is proposed for the fungus, the chief difference from *Cleistotheca* being that conidial stages are unlike.—The rapid drying of the onion sets is emphasised as the preventive measure.—*M. J. Prucha.*

792. Stevens, Frank Lincoln. **Two Illinois rhubarb diseases.** Illinois Agric. Exp. Sta. Bull. 213: 299–312. *Fig. 1–19.* 1919.—*Anthracnose* is due to *Colletotrichum erumpens*. The disease was found in several Illinois counties. It consists of a soft rot of the petioles; the diseased spots usually are soft, watery, and oval. When these spots attain a length of somewhat more than a centimeter, acervuli appear abundantly in the centers of the spots. The acervuli begin subcuticularly as an aggregate of hyphae which soon rupture the cuticle. Soon after this, the setae appear and spores begin to form. The fungus is readily isolated; its cultural characters are described, and its taxonomy is discussed.—Rhubarb *leaf spot* is due to *Phyllosticta straminella*. It mainly affects the leaf blade, forming irregularly circular dead spots from a few to several centimeters in diameter. Close inspection shows numerous very minute dark pycnidia. The microscope reveals the presence of a pycnidial fungus of the Phoma or Phyllosticta type. Spores issue in cirrhi. Cultural characters and taxonomy are given.—*M. J. Prucha.*

793. Tanaka, Tôzaburô. **New Japanese fungi. Notes and translations. VI.** Mycologia 11: 80–86. 1919.—See Bot. Absts. 3, Entry 730.

794. Tanaka, Tôzaburô. **New Japanese fungi.—Notes and translations. VII.** Mycologia 11: 148–154. 1919.—See Bot. Absts. 3, Entry 731.

795. WALDRON, L. R., AND J. A. CLARK. **Kota, a rust resisting variety of common spring wheat.** Jour. Amer. Soc. Agron. 2: 187–195. *Fig. 1–3.* 1919.—See Bot. Absts. 3, Entry 494.

796. WEHMER, C. **Leuchtgaswirkung auf Pflanzen.** [Effects of illuminating gas upon plants.] Ber. Deutsch. Bot. Ges. 36: 140–149. 1918.—See Bot. Absts. 2, Entry 614.

797. WEIR, JAMES R. **Concerning the introduction into the United States of extralimital wood-destroying fungi.** Mycologia 11: 58–65. 1919.—Attention is called to the absence of quarantine laws providing for a close scrutiny of imported timbers which may harbor wood-destroying fungi. *Polystictus persoonii* and *Trametes olypus* which are common and evidently serious rot producers in Japan and the Philippines were found on rotted timbers at Bellingham, Washington. Explanations are presented for the apparent small number of wood-destroying fungi in the tropics, and for the possibility of such species becoming serious pests in the temperate zone.—*H. R. Rosen.*

798. WURTH, TH. **Verslag omtrent de werkzaamheden van het Proefstation Malang over 1917.** [Review of experiment station activities for 1917]. Meded. Proefst. Malang. Java 22: 1–20. 1918.—*Notes are given on some diseases of* Para rubber and coffee. For the former, daily prophylactic disinfection of the tapping cut was found necessary to prevent the spread of canker (*Phytophthora faberi*). Die-back (*Gloeosporium alborubrum*) was severe on trees of all sizes: for the control of it pruning out the diseased parts and spraying adjacent trees with bordeaux mixture are recommended. The brown root disease (*Hymenochaete noxia*) of coffee was most severe where this crop was planted with *Ficus* and *Hevea*.—*R. D. Rands.*

799. YOUNG, HARRY C., AND E. H. COOPER. **A method of determining the fungicidal coefficient of lime-sulfur and other common fungicides.** Rept. Michigan Acad. Sci. 19 (1917): 221–236. 1918.—The writer formulated a method to determine fungicidal value of fungicides based on the government Hygienic Laboratory method of Anderson and McClintic which determines the bacterial coefficiency of disinfectants by comparing them with a phenol solution of a standard strength. The writer used *Glomerella rufomaculans* and *Endothia parasitica* with lime-sulfur, ammoniacal copper carbonate and neutral copper acetate against a copper solution of a standard strength.—*G. H. Coons.*

PHYSIOLOGY

B. M. DUGGAR, *Editor*

DIFFUSION, PERMEABILITY

800. LUTMAN, B. F. **Osmotic pressures in the potato plant at various stages of growth.** Amer. Jour. Bot. 6: 181–202. *1 table, 2 fig.* 1919.—A series of determinations of the osmotic pressure of sap from various regions in the potato plant at various stages in its growth was made by the use of the method of freezing-point depression. The pressure in seed tubers was found to be between 7 and 10.3 atmospheres, but this is considerably lowered by the absorption of water after planting. The juice of leaves from the young plant shows a higher pressure than that from the stalk, and both are higher than that from the seed piece. With the formation of flower buds and young tubers, the pressure becomes greater in the stalk than in the leaves. In the tuber the pressure remains constant from the first. The pressure in the stalk continues high throughout the active tuber and starch period, due to the presence there of an abundant supply of sugar; but with the return of cool weather and the renewed growth of foliage, it is finally exceeded by the pressure in the new leaves. The pressure in old plants is higher than in young ones, but falls as the plant becomes moribund. The author concludes that a superior osmotic pressure is necessary for the formation of new growth but is not necessary to maintain an organ after it has been formed. He points out the necessity

of assuming that leaves are directly connected with the root system by a series of tubes the side walls of which are comparatively impermeable, since otherwise the water would be removed from the tubes by the cells of the stalk, where osmotic pressure is higher than in the leaves. He concludes also that high osmotic pressure is not necessary for the growth of reproductive organs, since both tubers and potato berries (as well as tomato fruits) attract to themselves an abundant supply of reserves, although they maintain a very low osmotic pressure. The factors which control the movement of food reserves is unexplained. The bearing of these investigations on the physiological disease of potatoes known as "tip-burn" is set forth.—*E. W. Sinnott.*

801. Shearer, C. **The action of electrolytes on the electrical conductivity of the bacterial cell and their effect on the rate of migration of these cells in an electric field.** Proc. Cambridge Phil. Soc. 19: 263–265. 1919.—The conductivity of a thick creamy emulsion of the meningococcus or *B. coli* made up in neutral Ringer's solution and measured by a Kohlrausch bridge and cell shows that its resistance is 110 ohms or more than treble that of the Ringer's solution without the bacteria. A bacterial emulsion made of NaCl (0.85 per cent) has a resistance of 110 ohms. This gradually drops so that the resistance becomes equal to that of 0.85 per cent NaCl solution without bacteria. KCl, LiCl, and $MgCl_2$ act like NaCl in reducing the resistance offered by bacteria. Bacterial emulsions made up in $BaCl_2$, $CaCl_2$, and $SrCl_2$ having the same conductivity as Ringer's solution show no change in resistance for some time, invariably remaining normal. Certain trivalent salts have no action in increasing or decreasing the resistance of the bacterial cell as determined by the conductivity method, but affect the rate of migration of these cells in an electric field.—*Michael Levine.*

WATER RELATIONS

802. Shreve, Edith B. **Investigations on the absorption of water by gelatin.** Jour. Franklin Inst. 187: 319–337. 1919.—Physiological conclusions from the incomplete information at present available concerning imbibition by jellies are shown to be unwise. The advantages and disadvantages of the various methods of measuring imbibition are discussed. The method of weighing was adopted for this work. The rate of imbibition and the total quantity of imbibed water at apparent equilibrium increased with increase of temperature. No true equilibrium seems attainable at any given temperature between 10° and 30°C., if sufficient time is allowed. In the Hofmeister series all the compounds except sugar caused increased imbibition when incorporated in the composition of the gel preliminary to the imbibition tests. This is quite different from Hofmeister's results when the compounds are in the surrounding liquid, for then some do and some do not cause swelling.—*Ernest Shaw Reynolds.*

803. Stewart, E. Grace. **Mucilage or slime formation in the cacti.** Bull. Torrey Bot. Club 46: 157–166. *Pl. 8.* 1919.—A review of views of earlier workers. It appears that opinions are about equally divided as to whether mucilage arises from the wall or from the protoplasm, but several agree that it is accumulated between the plasma membrane and the wall. A study was made of *Rhipsalis rhombea, R. pachyptera, R. Houlletiana, Opuntia inermis,* and *Pereskia Pereskia.* In the leaves of flower buds of *Opuntia* and of *Rhipsalis* and in the other young tissues mucilage cells are often large and numerous, but their size is not due to imbibition of water by the mucilage; it is due to true growth, and becomes evident before any mucilage formation has begun. The mucilage appears first as a thin film between cell wall and cytoplasm, and as it increases the cytoplasm is crowded in toward the center of the cell, the mucilage becoming alveolar; the cell wall nowhere shows a breaking down. Imbibition experiments show that joints of *Rhipsalis* swell, particularly in the growing regions. this transformation of cell-contents into mucilage which absorbs water, "may be of importance in conserving and regulating the supply of water for the growing cells themselves."—*P. A. Munz.*

MINERAL NUTRIENTS

804. Purvis, J. E. **Bracken as a source of potash.** Proc. Cambridge Phil. Soc. 19: 261–262. 1919.—See Bot. Absts. 3, Entry 479.

METABOLISM (GENERAL)

805. BATES, FREDERICK, AND H. W. BEARCE. **New Baumé scale for sugar solutions.** Jour. Franklin Inst. 187: 215. 1919.

806. HAWK, PHILIP B., HAMILTON R. FISHBACK, AND OLAF BERGEIM. **Compressed yeast as food for the growing organism.** Amer. Jour. Physiol. 48: 211–220. 1919.—Young white rats, when given a complete diet except for lack of "water-soluble vitamine," showed loss of weight or exceptionally low gains, but when small quantities of dried Fleischmann yeast were added to the diet immediate, substantial gains took place. The growth-promoting power of compressed yeast is not destroyed by heating to 105°C.—*Ernest Shaw Reynolds.*

807. HAWK, PHILIP B., CLARENCE A. SMITH, AND RALPH C. HOLDER. **Baker's yeast as food for man.** Amer. Jour. Physiol. 48: 199–210. 1919.—Fleischmann yeast was used as a substitute for varying percentages of the protein diet and also at times as the source of the "water-soluble vitamine." Under both of these conditions yeast was found to be useful to the body, and in large quantities it had a laxative action.—*Ernest Shaw Reynolds.*

808. HOLLINGSHEAD, R. S. **Chemical analyses of logan blackberry (loganberry) juices.** U. S. Dept. Agric. Bull. 773. *18* p. 1919.—See Bot. Abstr. 3, Entry 808.

809. ICHIMURA, TSUTSUMI. **On the localization of anthocyanin in the spring leaves of some trees and shrubs in the temperate regions of Japan.** Bot. Mag. Tōkyō 33: 12–15. 1919.—This paper describes the localization of anthocyanin in the young leaves of 69 species of Japanese plants belonging to 31 families, including in this account 45 genera. The results are presented in tabular form and show that in the majority anthocyanin occurs in the mesophyll, or both epidermis and mesophyll. The figures are as follows: epidermal hairs, 3 per cent; epidermis, 10 per cent; mesophyll, 47 per cent; epidermis and mesophyll, 39 per cent. "It is also noticeable that the lower epidermis and lower hypodermal layer are richer in the pigment than the upper ones in the young leaves."—*L. L. Burlingame.*

810. KENDALL, ARTHUR I., AND MARJORIE RYAN. **A double sugar medium for the cultural diagnosis of intestinal and other bacteria.** Jour. Infect. Diseases 24: 400–404. 1919.—A new double sugar medium is described; this medium consisting of nutrient agar containing 2.5 per cent agar, 1 per cent saccharose, and 0.1 per cent mannitol, the reaction being adjusted so that the color, when the Andrade indicator is added, is faintly pink when hot. This medium can be advantageously applied to the cultural diagnosis of aerobic bacteria in general.—*Selman A. Waksman.*

811. LYNCH, VERNON. **The function of the nucleus of the living cell.** Amer. Jour. Physiol. 48: 258–283. 1919.—Enucleated *Ameba proteus* cells live almost as long as nucleated cells deprived of food; movements are somewhat affected; nutrition is disturbed; and sensitiveness to changes of oxygen content of the environment, to high or low temperatures, and to cyanide is increased. The results favor the "synthesis" theory of function of the nucleus.—*Ernest Shaw Reynolds.*

812. MOTTRAM, V. H. **Sudan III and the detection of fat.** Jour. Physiol. [London] 52: xviii–xix. 1918.—"One gram of the powdered solid is shaken with 10 cc. of the saturated solution of Sudan III in 70 per cent alcohol for a minute. The fluid is filtered off through a small fat-free filter paper and the color of the resultant compared with that of a control." For the control 1 gram of fat-free powder is treated as above. "When the tested solid contains more than 0.04 gram of fat the Sudan III filtrate is markedly lighter in color than the control." A colorimetric quantitative method for determining fat content might be worked out upon this basis.—*Ernest Shaw Reynolds.*

813. Voegtlin, Carl, and C. N. Myers. Distribution of the antineuritic vitamine in the wheat and corn kernel. Amer. Jour. Physiol. 48: 504–511. 1919.—Feeding experiments of "degerminated" corn and wheat in contrast with whole grain upon adult pigeons show that the vitamine is entirely in the embryo; and suggestions are made that the germination processes depend upon the presence of the vitamine, possibly due to direct relationship to metabolism.—*Ernest Shaw Reynolds.*

814. Zerban, F. W. Progress report of Chemical Research Department of the Louisiana Sugar Experiment Station for 1918. Louisiana Planter and Sugar Manuf. 62: 219–222. 1919.—There are various substances in sugar cane that affect the color of the cane juice. These include chlorophyll, anthocyanin and saccharetin. The different polyphenol compounds, especially in the presence of iron, are largely responsible for the darkening of the cane juice.—*C. W. Edgerton.*

METABOLISM (NITROGEN RELATIONS)

815. Zerban, F. W., and E. C. Freeland. The color of sugar cane products and decolorization in factory practice. Louisiana Agric. Exp. Sta. Bull. 165. 38 *p.* 1919.—The coloring matter in cane juice is mostly due to anthocyanin and the different polyphenol compounds, especially in connection with iron.—*C. W. Edgerton.*

816. Koser, Stewart A., and Leo F. Rettger. Studies on bacterial nutrition. The utilization of nitrogenous compounds of definite chemical composition. Jour. Infect. Diseases 24: 301–321. 1919.—Various amino-acids are quite similar in their ability to support the growth of certain microörganisms. Urea, taurin, creatin, hypoxanthin and uric acid are inferior to amino acids as immediately available sources of nitrogen. Allantoin gives results similar to the amino acids. Combinations of amino-acids or of amino-acids and other nitrogenous compounds offer no advantage over any single amino-acid. Certain organisms, such as *B. anthracis*, *Proteus zeukeri*, *B. abortus*, *B. diphtheriae*, *B. hoffmanni*, *B. dysenteriae*, and all of the cocci studied with the exception of *Sarcina lutea*, in a few cases, consistently failed to develop in all of the media employed. *B. pullorum* developed slightly in one instance only, while *B. typhosus* exhibited a slight growth in a few media. An extensive bibliography is appended.—*Selman A. Waksman.*

METABOLISM (ENZYMES, FERMENTATION)

817. Coates, C. E. Some notes on the clarification of the juice from frozen and sour cane. Louisiana Planter and Sugar Manuf. 62: 40–41. 1919.—In sugar cane which has been frozen, three types of fermentation develop. (1) There may be a softening of the tissues of the cane with the release of gummy substances into the juice. (2) Gums may be produced by the fermentation processes, these being induced by *Leuconostoc* and other organisms. (3) Acetic acid fermentation may develop. Methods of treating the cane juice to counteract the fermentation processes are discussed.—*C. W. Edgerton.*

818. Diehl, Harold S. The specificity of bacterial proteolytic enzymes and their formation. Jour. Infect. Diseases 24: 347–361. 1919.—No proteolytic enzymes are formed by bacteria on media free from organic nitrogen. On protein-containing media enzymes are formed which will digest both gelatin and casein. The proteolytic enzymes are not preformed in the bacterial cell, but are dependent on the content of the medium on which the cell grows; the specificity of these enzymes is resident in the amino-acids composing the proteins and not in the proteins themselves. Proteolytic enzymes are apparently formed to correspond to the different amino-acids present in the medium whether these acids are combined or free.—*Selman A. Waksman.*

819. Kopeloff, Nicholas, and Lillian Kopeloff. The deterioration of cane sugar by fungi. Louisiana Agric. Exp. Sta. Bull. 166. 73 *p.*, *Pl. I, II*; *fig. 1.* 1919.—Fungi are to be found in practically all sugars and sugar products. Of these, species of *Aspergillus* and